TRANSPORTATION LIBRARY

Transportation Library
TF
1
.R13

APRIL 4, 1931

Railway Age

FOUNDED IN 1856

The
CYCLONE
SPARK ARRESTER

Fire Hazard from Stack Sparks Eliminated

No Netting. No Reduction of Steaming Qualities

Permits Use of Semi-Bituminous or Lignite Coal Without Sparks

Results obtained in actual service in a territory where fire hazards are extreme, justify the statement that the Cyclone Spark Arrester will promote a sparkless condition which the railroads have striven to attain for years without success.

Now in service on 300 locomotives.

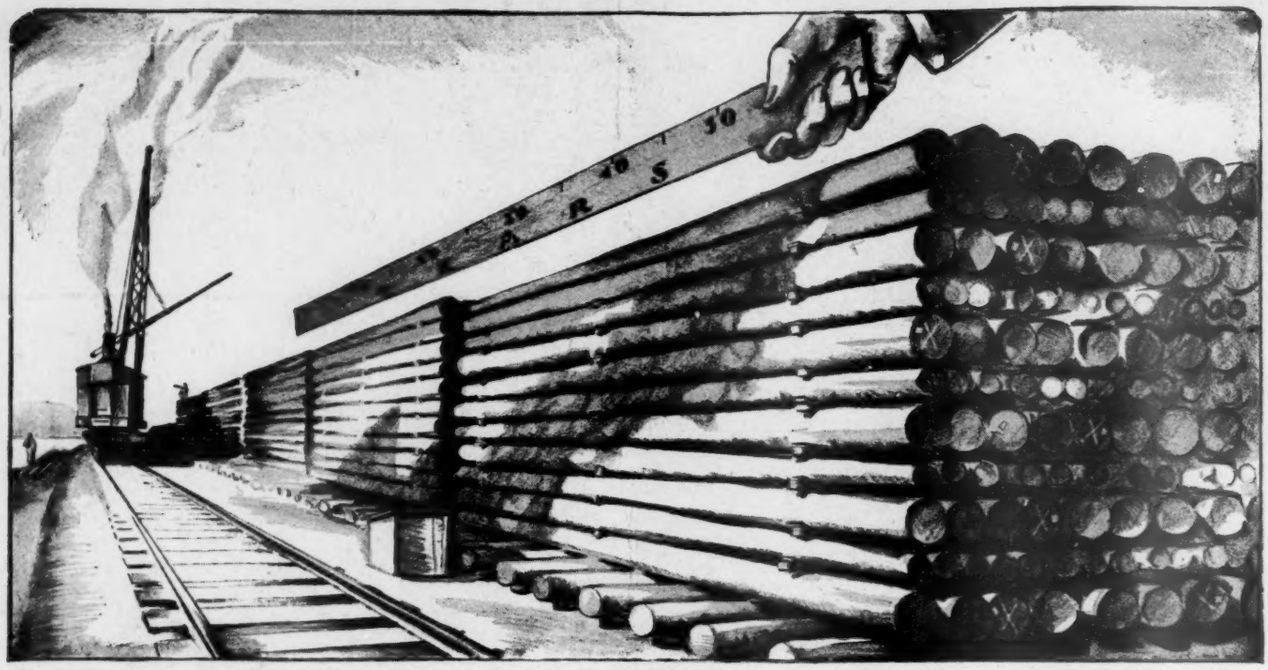
LOCOMOTIVE FIREBOX COMPANY

Manufacturers of Nicholson Thermic Syphons

NEW YORK CHICAGO MONTREAL

Alphabetical Index to Advertisers—Page 66

Buyers Directory of Advertisers—Page 59



The ultimate measure of pole quality—*YEARS*

Just as the yard-stick measures pole length ... the *year-stick* offers a safe and all-inclusive measure of pole *quality*. Poles that measure "long" on the year-stick—such as International Creosoted Yellow Pine Poles—can be depended upon to measure up just a bit better for each individual year of service.

Which is what you'd expect from International. For behind the dependability reflected by the longer, stronger life of International poles stands the fifty year International reputation for uniform high quality of product, painstaking integrity of methods, and continued promptness of performance.

International poles are quality poles . . . .

Every International pole is dated three times. One date-mark goes on when the pole is cut in the woods. Another mark indicates date of arrival at the plant. Vigilant observation of these dates insures quick removal from the woods and allows the poles to be properly seasoned according to time they were cut.

All of which permits an accurate time-control of the whole pole-making process — a time-control, supplemented with technical supervision, that means uniform seasoning, consequent uniform penetration of the creosote oil, and finally, the uniform International *quality* appropriately symbolized by the final date-mark — the International dating nail.

International

CREOSOTING & CONSTRUCTION CO.

PRODUCERS OF CREOSOTED YELLOW PINE POLES

Galveston . Beaumont . Texarkana

DISTRIBUTED BY GRAYBAR

Published weekly by Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa. Entered as second class matter, March 9, 1928, at the Post Office at East Stroudsburg, Pa., under the act of March 3, 1879. Address communications to 30 Church St., New York City.

Published every Saturday by the Simmons-Boardman Publishing Company, 34 North Crystal Street, East Stroudsburg, Pa., with executive offices at 30 Church Street, New York

All communications should be addressed to the New York Office, 30 Church Street

EDWARD A. SIMMONS, *President*
LUCIUS B. SHERMAN, *Vice-Pres.*
HENRY LEE, *Vice-Pres.*
SAMUEL O. DUNN, *Vice-Pres.*
CECIL R. MILLS, *Vice-Pres.*
FREDERICK H. THOMPSON, *Vice-Pres.*
ROY V. WRIGHT, *Sec'y.*
JOHN T. DEMOTT, *Treas.*

CHICAGO:
105 West Adams St.

WASHINGTON:
17th and H Streets, N. W.

CLEVELAND:
Terminal Tower

SAN FRANCISCO:
215 Market St.

Editorial Staff

SAMUEL O. DUNN, *Editor*
ROY V. WRIGHT, *Managing Editor*
ELMER T. HOWSON, *Western Editor*
H. F. LANE, *Washington Editor*

B. B. ADAMS
C. B. PECK
W. S. LACHER
ALFRED G. OEHLER
F. W. KRAEGER
E. L. WOODWARD
J. G. LYNE
J. H. DUNN
D. A. STEEL
R. C. AUGUR
R. A. DOSTER
JOHN C. EMERY
MARION B. RICHARDSON
H. C. WILCOX
NEAL D. HOWARD
RICHARD W. BECKMAN
LLOYD GEORGE
CHARLES LAYNG
GEORGE E. BOYD
WALTER J. TAFT
GARDNER C. HUDSON
M. H. DICK
W. J. HARGEST

The Railway Age is a member of the Associated Business Papers (A. B. P.) and of the Audit Bureau of Circulations (A. B. C.)

Subscriptions, including 52 regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free; United States, Mexico and Canada, $6.00. Foreign countries, not including daily editions $8.00.

Single copies, 25 cents each.

Railway Age

With which are incorporated the Railway Review, the Railroad Gazette and the Railway Age-Gazette. Name Registered U. S. Patent Office.

Vol. 90 April 4, 1931 No. 14

In This Issue

A Railroad Umpire Would Remedy Many Major Ills ..... Page 665

F. J. Lisman proposes a specific plan designed to strengthen railway credit, eliminate wastes, develop a more scientific rate structure and improve service and earnings.

Four-Mile Line Requires Three Million Yards of Fill 671

A description of a relocation project, involving a new bridge over the Illinois river and four grade separation structures, now being carried out by the Atchison, Topeka & Santa Fe near Chillicothe, Ill.

N. Y. C. Obtains Better Results in Stores Work 682

Tells how this road handles a larger business with less stock and fewer men, by providing improved facilities, adopting container methods and using more power.

EDITORIALS

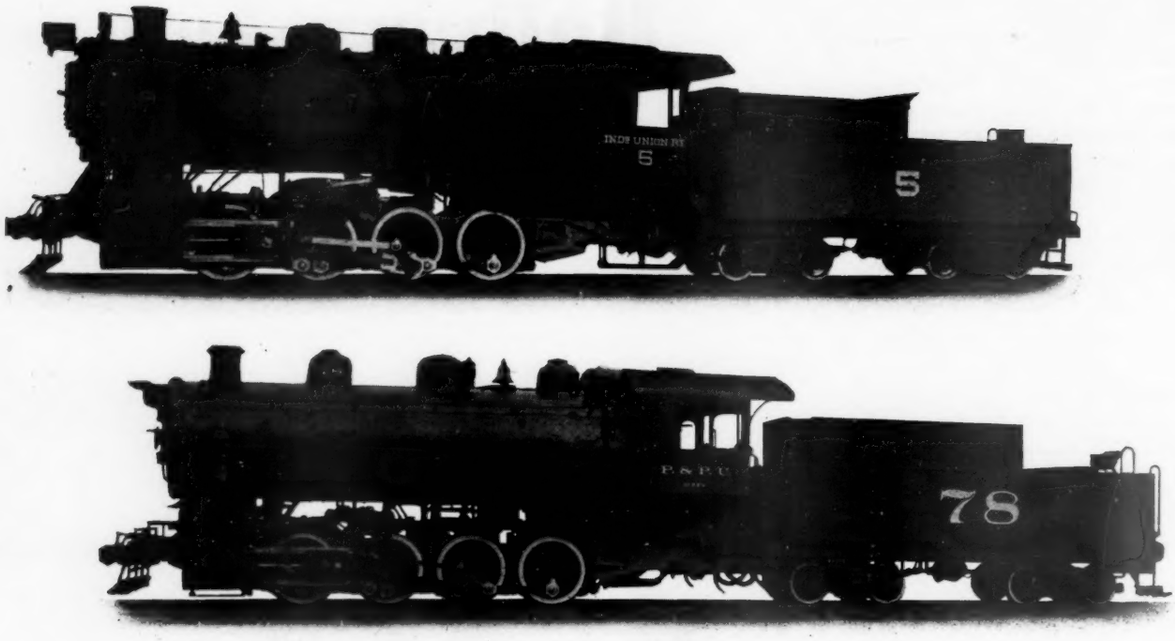
Transportation and the "Capitalistic System" 661
Birmingham Realizes Importance of Its Railways 663
Economy In Car Cleaning 663
More Progress In Water Treatment 664
Freight Handling Costs 664

GENERAL ARTICLES

A Railroad Umpire Would Remedy Many Major Ills, by F. J. Lisman 665
Lehigh Valley Buys Two 4-8-4 Locomotives 669
Four-Mile Line Requires Three Million Yards of Fill 671
Freight Car Loading 675
Twenty-Four Years' Operation on the Spokane, Coeur D'Alene & Palouse, by A. J. Mayham 676
New Missouri Pacific Drover-Caboose Cars 680
The C. P. R. in 1930 681
N. Y. C. Obtains Better Results in Stores Work 682
The Pennsylvania's Telegraph Department, by George D. Ogden 686

LOOKING BACKWARD 686
COMMUNICATIONS AND BOOKS 687
ODDS AND ENDS 688
NEWS 689

The Railway Age is indexed by the Industrial Arts Index and also by the Engineering Index Service



Switching Power should be an Asset– not a Liability

SCHEDULED freight trains, many at passenger speed, must be handled by high-power, up-to-date road engines.

But to make possible these schedules, such trains must be assembled and handled in yards by switching locomotives of ample capacity and assured reliability. Otherwise the entire freight movement is subject to delay, with resulting inconvenience and possibly loss to shippers.

Many railroads have demonstrated that it is sound economy to replace switchers of old design and inadequate capacity with modern locomotives, specially designed for this important work.

THE BALDWIN LOCOMOTIVE WORKS ★ 1831 1931

THE
BALDWIN
LOCOMOTIVE WORKS
PHILADELPHIA

RAILWAY AGE

Transportation and the "Capitalistic System"

The United States affords the best example ever known of the "capitalistic system"—that is, the system of private ownership of property and management of it for private profit. The full success of this system requires a minimum of government interference with business and a maximum of ability and statesmanship in the management of large business enterprises. It is inevitable that in a period of general suffering from reduced incomes there should be much questioning of the soundness of the capitalistic system. Such a period as we are passing through can make more radicals than many years of socialistic propagandising.

What is passing through the minds of many persons of widely differing political and economic views is illustrated by quotations that recently have appeared in the press from utterances of Senator Wheeler, a radical western public man; Daniel Willard, a railroad president, and Wallace Brett Donham, dean of the Harvard Graduate School of Business Administration. "Socialism and communism will not be brought about in America by agitators," said Senator Wheeler. "If they come they will be caused by those who denounce them the loudest. Why is there no real political leadership in this country? Because the industrial leaders who know only how to make money and pay dividends, without regard for the rest of the world, have for so long completely dominated the press and politics." The capitalistic system, Mr. Willard declared, affords "a better and fairer basis upon which to build an economic structure than any other system so far devised and tested by man," but he added, a system under which it is possible for six millions of willing and able-bodied men to be out of work for months can be said to have failed in at least one very important respect. "The employee who has been shaking in his boots for fear of his job the last few months," said Dean Donham, "and the erstwhile employee who is now pounding the pavement, may rightfully blame business leadership for his condition."

On March 30 the Chicago Tribune published a cartoon which was a significant supplement to such utterances. It indicated that in 1910 the high cost of living was labor's chief worry; that in 1920 the high cost of labor was capital's chief worry; while in 1931 the high cost of government is the chief worry of both of them.

Business Men and the Railroad Program

As the nation is passing through the depths of this depression and beginning gradually to emerge from them, business men and the public are confronted with numerous very difficult and important problems, but by none more important and difficult than the transportation problem. Transportation conditions at present are a chaos. By incompatible government policies of strictly regulating the country's most important means of transportation without subsidizing it, and of subsidizing competing means of transportation without regulating them, the state and national governments have succeeded in threatening with destruction the earning capacity and service of the railroads. What have business leaders to do with this? The greatest writer on business and economic subjects in the United States—a man prominently connected with big business and a stout defender of the capitalistic system—recently said in a letter to the editor of the *Railway Age,* "There is more at stake in the (railroad) fight than earnings of the railroads. It involves the question of the competency of democracy to deal with the complicated economic questions which have developed in modern life. The mass of the people, including even perhaps a majority of our successful business men, give little attention except to their own personal interests. They even neglect the large questions which involve their own interests, and take a short-sighted view of the manner in which their interests are concerned. *Anything that promises to reduce the cost of transportation to themselves immediately or in the near future they are ready to favor, and this illustrates their attitude upon economic questions generally.*" (Italics are ours)

The man that wrote that indictment of a majority of our successful business men was never directly or indirectly connected with a railroad. Is his indictment justified? Facing a very bad situation, the executives of the railways have submitted to the public a program,

the adoption of which they believe is necessary to enable the railroad industry to recover its earning capacity and continue to render good service. That program is, briefly, first, a respite from reduction of railway rates by regulation; second, withdrawal of all subsidies from means of transportation; third, similar regulation of all means of transportation. Do business leaders believe that with such earnings as the railways have been making regulation should continue to reduce their rates? Are business leaders willing frankly to say to the public that they want other means of transportation subsidized at the expense of the taxpayers while railways are not likewise subsidized? Are they willing to say to the public that the railways should continue to be regulated as they are, while almost no regulation should be applied to other means of transportation? No business leader has dared frankly and publicly to so declare himself.

While, however, some business leaders have endorsed the railroad program, others have not only not endorsed it, but have deliberately misrepresented it, and have called the thing they have misrepresented it to be a "declaration of war" upon other means of transportation and upon industry in general. Perhaps the most amazing utterance upon the subject has come from Horace M. Hill, president of Janney, Semple, Hill & Company of Minneapolis. "Stripped of all qualifying language," said Mr. Hill, in a radio address delivered on March 18, "the program contemplates the withdrawal of all forms of government aid or assistance to any form of transportation other than railroad transportation. It further aims at a system of regulation of all other forms of transportation, the ultimate objective of which would be to bring the whole system of fares and charges in the nation's domestic business by railroad, by pipe lines, by carriers upon public highways and waterways and upon the high seas up to a level where it can be profitably carried *by the most expensive form of carriage.*"

No statements more false ever emanated from the mouth of man. First, the government has not aided the railways, as Mr. Hill asserts, by assuring them a return of 5¾ per cent, for the simple reason that it has never let them earn that return. Secondly, what the railroads have asked is, in effect, that all means of transportation shall be similarly dealt with in order that all traffic shall move *by the least expensive form of carriage,* differences in service considered. Obviously, the true cost of any form of transportation, whether by waterway, highway or railway, is the total amount spent to provide the service, and there can never be any assurance that traffic will be moved by the least expensive means while some means of transportation must pay all their costs out of their own earnings, while other means of transportation have part of the cost of rendering their service paid by the taxpayers.

Taxes Versus Freight Rates

What is the real reason for such misrepresentation of the railways' program, which is emanating from many sources? It is the desire of shippers, including many business leaders, to get the taxpayers to bear a large part of the cost of transporting their freight by highway and waterway. But is this a sound economic policy for the nation? Is it good business, even for those who hope to benefit by it? Business concerns pay both freight rates and taxes, and if freight rates are reduced at the cost of a greater increase in taxes, the combined burden of freight rates and taxes paid by business concerns is increased. If business concerns pass the burden along to the public in higher prices, then the total burden of freight rates and taxes borne by the public is increased, and becomes an unnecessary brake upon prosperity and the means of deepening and protracting depression.

Business men can ascertain accurately the amount they pay in freight rates for transportation. They cannot ascertain accurately the taxes they pay for transportation. Will it always be, in consequence, impossible to get most of them to consider the certain economic effects of increasing taxes to subsidize transportation? They know the effect upon their net earnings of increases in taxes in general. Surely they do not think that increases of taxes to subsidize transportation have any different effect upon their net earnings. Total taxes paid by the American people increased two billion dollars annually, or almost 30 per cent, between 1923 and 1928. This increase in the cost of government, which is now so burdensome to business, included an increase in the cost of subsidizing means of transportation competing with the railways. Business men merely waste their breath when, as taxpayers, they criticize the increased cost of government, if, as shippers, they urge increased government expenditures to subsidize transportation.

The fight for the railroads "involves a question of the competency of democracy to deal with the complicated economic questions which have developed in modern life," said the eminent writer quoted above. The way many business leaders think and talk about the transportation problem is not such as to inspire confidence in "the competency of democracy." These men should understand our "complicated economic questions" much better than most of the people, but they show no understanding of them when "anything that promises to reduce the cost of transportation to themselves immediately or in the near future" is favored by them regardless of its probable effects upon taxation, the total cost of transportation, the maintenance of good railway service and the reasonable protection of the railroads as one of the nation's greatest investments and largest purchasing and employing industries.

Business Men as Socialists

Senator Wheeler, radical though he may be, was right for once when he said that "socialism and communism will not be brought about in America by agitators" but, if they come, will be caused by the short-sighted selfishness of business leaders. The real leaders

of socialism in this country are not soap box orators, but business men who, while professing to be opposed to all forms of socialism, advocate and defend any kind of socialism that they believe will, even temporarily, increase their own profits. Sooner or later real leaders of business must arise who will recognize the fact that the prosperity of their own industries depends upon the prosperity of the nation, and that this, in turn, depends upon economically sound government and business policies in dealing with all industries; and when such leaders appear we will begin to make some real progress toward solving our transportation and other vitally important problems, and toward preventing the recurrence of conditions which are a menace to the entire capitalistic system.

Birmingham Realizes Importance of Its Railways

The Birmingham (Ala.) Traffic and Transportation Club has inaugurated a vigorous campaign in behalf of the railroads, following a program which it calls the "Birmingham Plan." This plan contemplates, among other things, the following: Studies and reports by committees on the various aspects of the railways' importance to the industrial and economic life of Birmingham; the securing of well-known speakers to address the club and its invited guests; an endeavor through addresses and personal contacts to interest the service clubs and other business men's organizations in the program; energetic support of legislation to submit commercial motor vehicles to the same basis of self-support and regulation as that imposed upon the railways; advocacy of legislation to enable the railways more latitude in making rates to meet competitive conditions, without such rates being used as a gage of fairness of rates to other points; in general, to pursue a policy designed to permit the railways to earn a fair return and, in good years, to be able to build up reserves for the bad; and, finally, to give widespread publicity to all these activities to the end that public interest may be aroused.

The officers of the club are industrial traffic men—not railroad officers—and their interest in securing better railway conditions comes, not from immediate self-interest, but from the belief that "no greater service could be rendered at this time to our industries, our carriers, and our state than to aid in the solution of this dilemma." These officers also point out that, "indissolubly linked with the difficulties of the railroads is the well-being of our great industrial district here, which, with its coal mines, its rail mills, its car plants, its ore mines, its coke ovens, its important lumber interests, and other basic industries, is peculiarly and very largely dependent upon the buying power of the railroads."

The railways of Alabama are fortunate in having such a champion. The activity is one which should spread to traffic clubs and business men's organizations in other cities, since industrial prosperity everywhere, and not in Birmingham alone, can come only with fair play for the railroads, assuring the continuance of their efficient service to industry and their ability to pay wages, interest and dividends and buy in normal volume the materials and supplies they need to carry on their business. This aspect of the stake the public has in railway prosperity cannot be overemphasized.

Economy In Car Cleaning

Car cleaning is a routine operation carried on by the railroads at large cost in the aggregate and, in individual cases, frequently representing an amount entirely out of proportion to other items of operating expense. This is true as relates to passenger equipment, in the cleaning of which many roads have effected substantial economies by analyzing the requirements and installing labor-saving methods and equipment best adapted to meet them. The same course of action is equally desirable in the field of freight car cleaning.

One of the most recent examples of what can be done along this line is afforded by the experience of the Grand Trunk Western in using a new car-washing plant recently constructed at its Elsdon Avenue, Chicago, car repair shops. This plant, which has been in operation since last December, is designed primarily for the cleaning of refrigerator cars, but can be used equally well for cleaning other freight cars. The cleaning operations at this point were formerly performed by a force of six car washers, who, using hot water in buckets in connection with cleaning solvents and brushes, cleaned the cars largely by manual labor. The maximum output which could be secured from this gang under these conditions was seven or eight refrigerator cars a day. By the installation of a modern hot water heating and storage system, with insulated pipe lines and hose connections throughout the entire length of the car-cleaning track, hot water is now provided at the cars at 170 deg. F. and from 10 to 15 lb. nozzle pressure. This permits the same force of car washers to clean an average of 27 refrigerator cars a day and, in addition, five or six box cars which have been loaded with hides, oils, coal, bone fertilizer, mustard, lime, cement, plaster, creosoted ties, etc. With the proper application of the cleaning solvent and subsequent washing with water at a sufficiently high temperature, many of these cars are cleaned, deodorized and placed in condition for subsequent high-class loading.

There can be no question but that many high-class freight cars are being seriously damaged by loading

with commodities such as mentioned, and that every effort should be made to minimize this practice by exercising greater care in the selection and placement of cars for loading. Where such damage cannot be, or at least is not being, avoided, the provision of modern hot water car-washing plants may be expected to save substantially in the labor cost of the cleaning operation, permit doing the work more thoroughly, return the cars to revenue service with less delay and, possibly most important of all, fit the cars for high-class loading, or at least as high-class loading as their mechanical condition will justify.

More Progress In Water Treatment

More than a quarter of a century has passed since the first water softening plants were installed on American railways, but it was not until 12 or 15 years ago that the roadside plant was generally recognized as an effective agency for the correction of troubles resulting from the presence of incrusting solids in boiler waters. However, it is significant that a definite change in attitude has taken place since that time, for whereas the earlier plants were installed virtually as a last resort in an effort to correct an extremely difficult operating condition, authority is now granted for such installations primarily on the basis of the economies to be effected.

Thus, the earlier plants were located primarily in territories where the use of water containing high concentrations of incrusting salts was attended by frequent engine failures and large expenditures for firebox and flue renewals. However, as a result of the demonstrated effectiveness of water treatment and the establishment of a definite measure of the savings resulting from the removal of a given quantity of incrusting solids, the criterion for authorizing an installation is now the volume of solids that are being carried into the boilers of locomotives in the water from a given source of supply. As a result, the volume of water used has become as important a factor as the concentration of incrustants, and waters containing as little as 7 or 8 grains of hardness per gallon are being treated, whereas it is not many years since it was deemed uneconomical to treat water containing less than about 20 grains of incrustants.

As an example of this change in policy, a large plant was recently placed in operation at an engine terminal between two engine districts carrying a heavy and unusually fast passenger and freight service which had been subjected to little difficulty in the use of a water containing 12 to 15 grains of hardness. However, the consumption of water at this terminal was so large that it was possible to show potential savings of 100 per cent per annum on an investment of $70,000 for treating facilities.

This, however, is but one side of the picture, for there has been a corresponding development in the use of boiler compounds. Like roadside treatment, resort was formerly had to interior treatment only in so-called bad-water districts, but with a growing appreciation of good boiler water, boiler compounds are being introduced into waters that were once considered "good enough" for use without treatment. There is still a large field for the further extension of chemical correction both through the installation of water softeners and the scientific application of boiler compounds.

Freight Handling Costs

With the volume of less-than-carload freight handled by the railways showing a downward trend with no immediate prospect of improvement, the item of freighthouse costs assumes formidable and growing proportions. The fact that the railways have taken some cognizance of this is evidenced by the number of lines that have completely revised their freighthouse practices by securing more adequate supervision by means of daily reports, and by various means of reducing the amount of clerical work necessary in local freight offices.

The methods of handling freight have also been given close scrutiny. Some roads are more fortunate than others in the possession of new facilities—buildings designed particularly with modern freight handling methods in mind. This is desirable, but even in the older facilities, reductions have been made in the cost per ton of freight handled by the installation of a good flooring surface and improvements in methods. There are numerous efficient tractor-trailer installations in operation, and loading and packing methods are undergoing constant revision, with a view to providing for less costly handling and also to reduce the number of loss and damage claims, always an important factor where less-than-carload freight is concerned.

All of this has been accomplished, but the ultimate in freight handling efficiency is still far from being reached.

There is still much room for improvement and the present is the ideal time for experiments. When freight is pouring over the platforms in a constant flood, and when the force includes new and inexperienced men, it is extremely difficult to do other than keep the freight moving by any method, unless advance preparations have been made.

With the relatively small amount of freight to be handled now, with the force consisting largely, if not entirely, of men of much experience, the opportunity is ripe for improvements in methods. Supervisory officers concerned with freight handling would do well to take advantage of the present opportunity.

A Railroad Umpire Would Remedy Many Major Ills

A specific plan designed to strengthen railway credit, eliminate wastes, develop a more scientific rate structure, improve service and earnings

By F. J. Lisman

"WHAT is going to become of the railroads—had I better sell my railroad securities" is being asked by people interested in securities everywhere; in the canyons of Wall Street and La Salle Street; clubs, trains, and wherever men meet.

The ubiquitous bond salesman and commission hungry stock broker, naturally, are endeavoring to capitalize this sentiment and are either openly advising or covertly suggesting the sale of all railroad securities as being the safe thing to do. This feeling has even spread to insurance companies and savings banks; if they buy railroad securities at all, they want nothing but the big underlying issues of the very largest systems. This is evidenced by the high prices paid for the best issues and the relatively low prices for everything else. This means that none but the very strongest railroad companies at present can do any financing at all.

Investors Increasingly Timorous

Insurance companies, representing millions of policy holders and savings banks, representing millions of depositors, as well as other corporations and individuals are getting very restless at the continuous decline in railroad earnings and the constant reports about increasing competition by other methods of transportation.

They want to know whether the railroads as a whole are co-operating to meet these changing conditions. They have heard that there have been discussions about some such move, but so far have seen no evidence of it. They will soon be demanding action.

Whenever an industry gets into deep water, there is generally co-operation for mutual protection which frequently takes the shape of a trade organization (insofar as such action is legally permissible) for the purpose of stopping competitive wastes and abuses.

Formerly—that is, before the enactment of the Sherman Law in 1891—railroads frequently engaged in rate wars and then formed pools or found other ways of increasing their revenue. By 1900, when Mr. Cassatt was president of the Pennsylvania Railroad there was brought about the famous era of the "community of ownership" which did not last very long on account of amendments to the I. C. C. act which, in effect, made such action illegal. The I. C. C. act, as amended in 1920, under Section 5, Paragraph I, distinctly permits pooling with the approval of the Commission. It also recognizes the fact that the rates charged by the carriers for service are necessarily the same and provides that the Commission permit that they should be high enough to yield a reasonable return on the value of the properties devoted to public service.

The object to be attained by the law was discussed and freely stated—that is, the rate structure was to be high enough to attract capital to the carriers in order to enable them to expand their facilities in accordance with public needs. Of late, the rate of return by the carriers has been inadequate for the purpose and something must be done about it. If freight or passenger rates cannot be raised or must be reduced here and there, in order to hold the existing business, then expenses must be reduced, if this be possible.

Unjustifiable Expense for Profitless Prestige

Railroads were developed in a spirit of competition greatly stimulated by the public, because every town wanted two or more railroads and this spirit of competition or emulation as between the different companies has been kept alive to such an extent that in many cases it is carried much too far for the benefit of the stockholders. Too frequently the officers of corporations forget that a railroad company is organized for just two purposes:

1. To serve the public;
2. To make a reasonable amount of money for the stockholders.

In no request for incorporation or in no set of by-laws can it be found that a company is organized for the purpose of getting business from competitors at any price; or, for the purpose of keeping up "prestige" regardless of cost. Nevertheless, this point of view seems to be uppermost in the minds of many officers. It is probably a very praiseworthy spirit, characteristically American, but it certainly is rather expensive for stockholders who frequently own securities of competing carriers, all of which may be wasting money in the direction indicated.

Many conditions are changing now in many directions. The spirit of extravagant competition is becoming obsolete because it is too expensive. The remedy is obvious—competition must be preserved within reason, that is, without waste. It is extremely doubtful whether competing railways can bring this about without some one acting as arbitrator. This is especially the case in connection with the complex rate structure as fairly exemplified by the case of "sugar rates" hereafter referred to. There is no denying the fact that individual railroad officers lack courage to suggest the raising of rates wherever this might be possible, for fear that their company might lose a large amount of traffic; therefore some one else who has no fear of enemies and who has no friends to reward, must accomplish this, and must also prevent further raids by

shippers on the revenue of the carriers. In short, an umpire is necessary.

A Detailed Plan

This article is written for the purpose of directing attention to the plan for an umpire. The writer has, therefore worked out a complete plan *as a basis for discussion.* It is suggested: That the railroad executives as a whole select a committee of 6 or 9 who would, by not less than a two-thirds vote, select someone qualified to be an umpire and that thereupon all railroads should be bound to accept such a selection.

The umpire would have under him three or more separate bureaus as hereafter fully described. He would serve for five years with the right of a committee of the presidents, something like the Presidents' Advisory Committee of 11, to remove him on six months' notice.

Any decisions rendered by the umpire would be subject to appeal by any carrier or carriers to a small committee of "elder statesmen" who, of course, should not be closely affiliated with companies having a parallel or antagonistic interest as regards the appealing company.

The expenses of the umpire and his organization would be borne by carriers pro rata to their gross earnings and to the amount of services availed of. That is to say, if a group of carriers in a given section should not wish to participate in any one of the bureaus created under the umpire's jurisdiction, then they would not bear the pro rata of such expenses.

The umpire would have with him an advisory committee of 7 with whom he would be expected to consult as to the various activities of his organization and no action would be taken by him if a majority of such advisory committee members were opposed to it.

The agreement to abide by the decision of the umpire with the above limitations must obviously be within the letter and spirit of the law. The I. C. C. and the Federal Trade Commission should be made cognizant of all activities of the umpire.

The various bureaus to be created would be as follows:— One for the study of rates, one for public relations, one on competitive wastes and, possibly, one for research.

1. **The bureau for the study of rates** would be set up for the purpose of

a. Simplifying the rate structure;

b. Raising rates wherever this is justified both from point of view of what constitutes a fair rate for the shipper and whether such increase will really produce additional revenue;

c. Studying the rate structure with a view to reducing rates if such reduction will bring additional gross and net revenue. Obviously, no action on rates could be taken except with the approval of the I. C. C. after the customary hearings and the inevitable, although regrettable, delays.

Co-ordinating Public Relations Work

2. **The bureau of public relations.** Many railroad companies have very pleasant relations with the citizens of the communities which they serve. They keep in close touch with the newspapers and keep newspaper men informed on their problems. Many railroads are more or less negligent in that respect. The bureau of public relations would study the public relations of the various companies so that all carriers might benefit by each other's experience and handle this complicated problem in a fair and intelligent way.

To spend large sums for publicity as has been done in the past probably does more harm than good. The public will always respond if the actual facts are told fairly and without overstatement. One of the most powerful, but frequently neglected, weapons is understatement. In order to reach the ear of the public, there is no reason why the railroads should not use the radio the same as demagogues and others are now doing at election time.

Certainly all local contacts should be left to the individual roads but the promulgation of national policies or interviews given out to the press associations should be supervised by an organization which makes a study of public relations and will measure the repercussion of statements on the different elements of the communities —politicians, farmers, shippers, labor, etc. Sometimes overworked executives have given out statements the effect of which has not been thoroughly weighed. For example, the recent attack on the pipe lines, in the writer's opinion, was ill-advised. Pipe lines have existed for nearly 50 years; they have been useful in developing the resources of the country and to prohibit their ownership by oil companies would not really be helpful to the railroads because it would merely lead to the kind of indirections which are not entirely unknown in the railroad world.

The railroads have the right to demand that no unnecessary pipe line should be built and that, therefore, new pipe lines should obtain a certificate of necessity and convenience, the same as a new railroad line and that the capitalization of such new pipe lines should be properly supervised so that they will be really constructed for the purpose of carrying oil, natural gas, or whatever else they may be suitable for, but not for the purpose of carrying securities which are to be distributed to an over-enthusiastic, over-propagandized public. A pipe line once built, just as a railroad once built, will try to get business even if no interest on its capitalization is paid or its original construction was not justified. Such a line is a menace to the existing pipe lines and railroads.

An End to Wasteful Competition

Public relations, as far as the railways are concerned, means informing the people of their problems. The average railway executive is not trained to measure the effect of his remarks on the public and it is therefore essential that this should be left to specialists who have had experience with this problem. Some people naturally take to publicity like others take to mechanics —many of our successful politicians are natural publicists.

3. **The bureau for the elimination of competitive wastes** would study the following:

a. The elimination of excessive competitive passenger service between large centers.

b. The elimination of non-paying competitive package car service. The fact that l.c.l. business now constitutes less than 2½ per cent of the total railroad tonnage while it uses nearly 25 per cent of the cars, is in itself a proof of large waste.

c. The elimination of competition of round-about lines. Too many railroads compete for business on which they really do not make any money. Possibly a rule might be agreed to that a line more than 25 per cent or 30 per cent longer than a short line between any two points should not endeavor to compete provided there are at least two competitors for such business.

d. The elimination of unnecessary competitive sta-

tions in country districts where such stations may be within a mile or two of each other.

e. The co-ordination of trackage or terminals wherever possible in order to avoid additional capital expenditures.

f. Such other competitive wastes which might be referred to this bureau by carriers or by the I. C. C.

Intensify Research Activity

4. The Bureau of Experimentation. This fourth bureau might be added. It might possibly be deemed advisable to merge the American Railway Association and the umpire organization. The A. R. A. is now spending but about $400,000 a year on laboratory work which is less than one cent for every hundred dollars earned by the railroads. This amount, even if doubled to account for money expended for this purpose by individual companies, is pathetically small compared with what such organizations as the American Telephone & Telegraph Company, the General Electric Company, the American Radiator Company and many other large corporations are spending. Many such concerns spend over one dollar out of every hundred dollars earned for that purpose—or relatively more than 100 times as much as the railroads.

The work accomplished by the A. R. A. with this limited amount, such as in connection with the power brakes, rail fissure finders, etc., has been of great benefit—only it has not moved fast enough.

Such a bureau should not only study promising improvements and inventions but should also be able to suggest the best places to apply them or try them out. It should solicit suggestions from all quarters, not only as to mechanical improvements but also as to improvements in service. Some employee of the Florida East Coast Railroad may suggest something which may not be applicable to that particular property, but may be very suitable for the Duluth & Iron Range. Similarly an employee of the San Diego & Arizona may suggest an improvement suitable to the Bangor & Aroostook. Co-ordination for this purpose should be worked out for the benefit of all parties concerned.

The bureau for the study of competitive wastes and for the study of mechanical and service improvements would be very attractive not only to college bred men but to men now in railroad service. A new spirit of enthusiasm would spring up because there is many an employee who has felt that there has been no outlet for his thoughts within his own organization. This remark, obviously, does not apply to all companies, but certainly it does apply to more than should be the case.

Should Plan Be Tried Territorially?

Many railroad men think that the idea of an umpire should be first tried out in one section before trying it in the country as a whole. At first sight, such a moderate beginning seems desirable; others have suggested separate umpires for the northwest, southwest, northeast and southeast. But thinking the matter through further, it clearly develops that lines west of Chicago and St. Louis are so interwoven that they cannot be separated. Quite likely the roads leading from Chicago and the Twin Cities to the north Pacific Coast points need an umpire more than any other section, but this territory cannot be dealt with without including routes through and affecting the Omaha gateway and once the Omaha gateway is included, the Kansas City gateway must follow; again, if the Kansas City gateway is included, the whole southwest is involved. The deduction might be made that the territory west of Chicago and St. Louis could form a sufficiently large group but there are four carriers crossing this dividing line—the Illinois Central, the St. Louis-San Francisco, the Wabash and now the Baltimore & Ohio in connection with its ownership of the Chicago & Alton. However, this is the minor part of the problem.

Freight rates are so very delicately adjusted on a competitive basis that a change in rates from Pacific Coast points to the Mississippi River crossings affects rates from the Atlantic and Gulf and from territory in between. This is well exemplified by the pending application of the lines terminating on San Francisco Bay to reduce rates on refined sugar to Chicago about 19 cents per hundred pounds—from 84 cents to 65 cents. The battle over the relative sugar rates was fought in 1922 and it was hoped was then settled. The refineries in San Francisco, working on duty-free Hawaiian sugar, were in effect allotted the territory west of the Dakotas, Kansas, Nebraska, Oklahoma and a north and south line across western Texas. The Pacific Coast refineries have since increased their output by a somewhat larger percentage than the refineries on the Atlantic Coast and Gulf of Mexico. They are now ambitious to increase their trade territory and, presumably for that purpose, have adopted the usual methods of browbeating the railroads by shipping their products by water from San Francisco to Chicago, through the Panama Canal to New York and through the Erie Canal and Great Lakes, claiming they can do this somewhat cheaper than by all-rail, in spite of transfers of cargo in New York and Buffalo. Last year it is reported that about 30,000 tons of Pacific Coast sugar moved that way while eastern refineries, including several located on the Hudson River, shipped but 6,000 tons to Chicago by water. Like all water competition this looks pretty on paper, but sugar is very subject to damage by moisture and to transport it through the hot tropics and through the Erie Canal and Great Lakes is quite amazing.

Balanced Rates, Not Rate Level, Industry's Chief Concern

Nevertheless, some of the railroads have fallen for this old game and are now asking for reduction of the sugar rate to about six-tenths of a cent per ton-mile. In order to sustain this case, they have filed an exhibit with the I. C. C. showing their out-of-pocket cost for handling this business over the short route at about four mills per ton-mile. At the same time the railroads are trying to get a rate increase on non-ferrous metals. The attorneys for the shippers of these metals will thankfully note the railroads' exhibits in the sugar case as excellent ammunition for their purpose. If the I. C. C. were to grant the request of the lines terminating in San Francisco for reduction of these sugar rates, the railroads running from the Gulf and Atlantic, in order to protect the refineries adjacent to their lines would be bound to ask for corresponding reductions so as to preserve the exact balance of rates as between different shippers and territories and they have already given notice of their intent to do so. The Pacific lines might (although they probably would not) gain $100,000 or even $200,000 in net earnings while the carriers as a whole would undoubtedly lose 1½ million and possibly more, in net, on the hauling of sugar throughout the country. Besides, another precedent of absurdly low rates would have been set. The western lines which are asking for the suspension of reduction in agricultural rates would be the principal sufferers. This proposed sugar rate also unbalances the rates on beet sugar from the beet districts of Michigan, Colorado, Utah, Idaho, etc. No doubt if the I. C. C. were to permit the requested reduction in sugar rates which is being initiated by the three lines terminating in San Francisco,

most other railways and their officers would blame the I. C. C. instead of the lack of backbone or the faulty organization of the responsible carriers. Sugar can stand a fair rate. The consuming public does not feel the difference of a few cents per 100 lbs.; the principal parties in interest are the refiners who want a balanced rate structure. This sugar rate in the final analysis is not a combat between the railroads but between the refineries located at different points and possibly even the sugar producers in the Hawaiian Islands and Cuba and the beet raisers within the continental United States.

Recently the lines running from Chicago to all Gulf ports from Galveston easterly to Pensacola, were granted fourth section relief as against the lines running from Chicago eastward in connection with trans-Atlantic business. All this proves the delicate balance of the rate structure which can really only be dealt with nationally and not sectionally. The railroads are merely the anvils which are being hammered by the competitors for business.

Similarly, lumber rates have been pulled down in many sections by the competition between shippers from the Pacific Coast and the south. Lumber rates might possibly be raised a trifle all around without affecting the competitive status of the shippers and without injury to any locality. Upon study surely many other similar situations would be found.

The umpire's job is a huge one and he could only become effective gradually. His organization would probably have all it could do to start with in one bureau—that on rates—and, therefore, the problems of the bureaus for publicity and competitive wastes might, for the beginning, be limited to particular territories; the principles established would spread very rapidly throughout the country.

Are Traffic Solicitors Too Numerous and Underpaid?

Within the next 30 days the annual reports of the various railway companies for 1930 will be issued. They will show heavy decreases all around with increased efficiency in the operating department, but there will probably be very few railroads which will show reduction in traffic expenses; some of them will show increases. In other words, many carriers are spending more money than before for the purpose of taking business away from each other.

The writer believes that if there were less off-line offices, possibly one-third as many solicitors at possibly twice their present salaries, with the elimination of the unfit, the net results would be more satisfactory. If the costs of the traffic department are 2½ per cent of the gross earnings a saving in that direction of 20 per cent, which is only equal to the economies in other departments, would amount to some 25 million dollars or about one-half of one percent of the gross earnings.

The elimination of a few million competitive, excessive passenger train miles would amount to at least one dollar per train mile. Other competitive wastes previously referred to would amount to many more millions. It is hardly conceivable that the umpire with all his bureaus would ever cost as much as five cents for every hundred dollars of gross earnings. The umpire organization would certainly pay for itself many, many times over.

What Man for the Job?

It is said that there is no man big enough to be a national umpire. Upon reflection it would appear that the umpire's job would not be nearly as complicated as that of the president or general manager of any one of the big systems. Whatever his job might be he would not have to settle a problem on the day it was brought to him. He would have time to meditate and consult. If he were a good executive, he would develop good advisers. He probably should have assistants in the different sections of the country, all of whom should be well paid—as well as the heads of the various bureaus.

His principal requirement should be tact; his next requirement would be more tact, and still more tact. He should be impersonal and have a broad understanding of the railroad business. He must have vision, courage and force and be of impeccable honesty. Necessity has always brought forth the man, and will again! If once the necessity of an umpire is agreed to, the man will be found, but he cannot be effective unless every railroad reaching gateways agrees to abide by his decisions, subject to the above-mentioned right of appeal.

In the final analysis the umpire's job is to increase the net earnings of the railroads as a whole. By attaining this, much will be done in the direction of getting a fair return to which the carriers are entitled not only under the Transportation Act of 1920 but under the Constitution. The efficient work of the umpire's organization should greatly lighten the work of the I. C. C. and therefore expedite it for the benefit of all parties concerned and to the great satisfaction of the Commission, with whom the umpire should closely co-operate.

Choosing the Umpire

A good way to select the umpire might be to have all executives deliver a secret ballot indicating their preference to a sub-committee appointed for that purpose, although possibly a special committee of five of the Advisory Committee of eleven might be suitable for the purpose.

There are a number of executives who enjoy the full confidence of their confreres who would be eminently suitable for the position. However, some or all of them may not be willing to accept it for the following reasons:

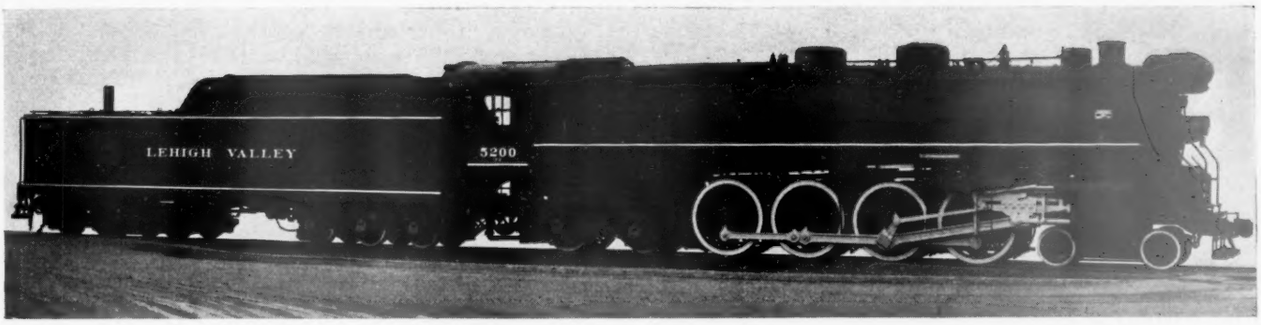
1. Because they are bound by contract to their present position.
2. Because they might be doubtful about the permanency or success of the plan.
3. Because they may fully realize the truth of the adage that "The wind blows strongest against the highest mountain" and they may fear to get chilled.

After the special committee had found out who is really available, there might be a second ballot or the selection might be left to this committee with the clear agreement that everyone would be bound by such selection.

The Legal Angle

Many lawyers question the legality of such an organization, although the umpire can do very little which is not subject to the approval of either the I. C. C. or state commissions. If, for example, the umpire should refuse to permit carriers terminating in San Francisco to apply for a reduction of the sugar rates, the refineries located on the Pacific Coast might still apply to the Commission for relief. Therefore, they would not be deprived of their rights by any alleged conspiracy in restraint of trade. The right kind of an umpire with the requisite amount of tact would have direct contacts with the large trade organizations and point out to them the unfairness of their propositions, if they should indeed be unfair. If trade organizations which have heretofore been in effect, fixing their own rates by manipulation and exploitation of the competitive spirit among railroads should come to realize that they cannot continue to operate on the net

(Continued on page 670)



Lehigh Valley 4-8-4 Type Locomotive Built by the American Locomotive Company

Lehigh Valley Buys Two 4-8-4 Locomotives

To be used in fast-freight service between the frontier and tide water—Purchased to haul 3,000-ton trains with minimum pusher service

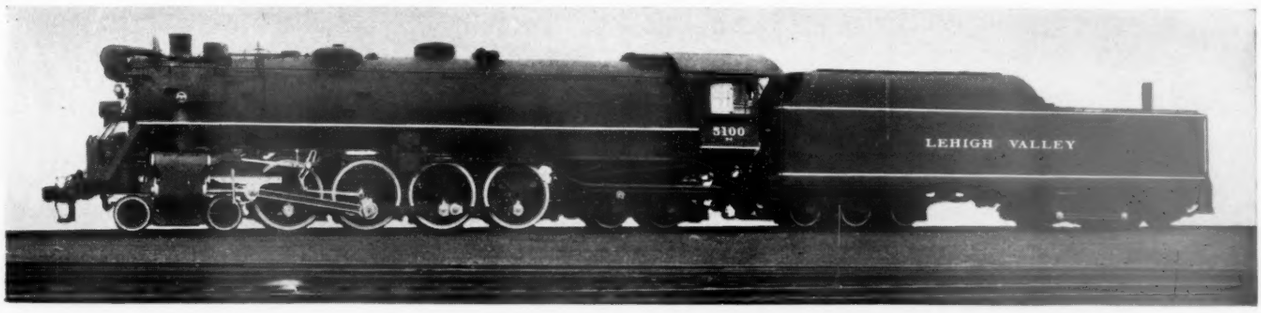
THE Lehigh Valley placed two 4-8-4 type locomotives in fast freight service last week for operation between the Canadian frontier and tidewater at Jersey City, N. J. Immediately on delivery, the locomotives were exhibited at different towns and cities along the line, and attracted considerable interest. Over 10,000 persons inspected the locomotives while they were on exhibition at Wilkes-Barre, Pa., and there were only a few points where the locomotives were exhibited that the attendance was less than 2,000.

Locomotive No. 5100, road class T-1, was built by the Baldwin Locomotive Works, and locomotive No. 5200, road class T-2, was built by the American Locomotive Company. The former has a rated maximum tractive force of 66,400 lb. and 27-in. by 30-in. cylinders, while the latter exerts a rated maximum tractive force of 66,700 lb. and has 26-in. by 32-in. cylinders. Both locomotives are equipped with Bethlehem auxiliary locomotives which have a rated tractive force estimated at 18,360 lb. This gives a starting tractive force for the No. 5100 of 84,760 lb., and 85,060 lb. for the No. 5200. Both locomotives have 70-in. drivers. The No. 5100 operates at a boiler pressure of 250 lb. and the No. 5200 at a pressure of 255 lb. They are designed to traverse curves of 18 deg.

Designed by Builders to Meet Railroad's Requirements

The locomotives were designed by the builders to meet the special requirements of the railroad for handling merchandise trains in fast-freight service. It was desired to operate the locomotives from Sayre, Pa., to Buffalo, N. Y., from Buffalo to Jersey City, N. J. and back to Sayre, and haul 3,000-ton trains with a minimum of helper service. With the new power, helper service is only required on the Mountain Cut-off, near Wilkes-Barre, Pa., where there is a long ascending grade of 1.14 per cent.

It will be noted from the table showing the principle weights and dimensions that the two locomotives are somewhat different with respect to essential features in design to secure approximately the same tractive force within the weight limitations. On the other hand, the



Left Side of 4-8-4 Type Locomotive Built for the Lehigh Valley by The Baldwin Locomotive Works

general appearance and construction of the two locomotives are essentially the same. Both have welded tenders and cabs. The crown and side sheets of the firebox are in three pieces, with the throat, flue sheet, door sheet and combustion chamber completely welded. The boilers, which are of nickel steel, have Type E superheaters, Elesco feedwater heaters with C. F. pumps, and four Thermic syphons, three in the firebox and one in the combustion chamber. Other special equipment includes Standard type BK stokers, Ragonnet Type E power reverse gears and Commonwealth one-piece bed castings in which are included the cylinders and air reservoirs. Commonwealth front and rear engine trucks are used, the front truck being equipped with SKF roller bearings.

Steam distribution is obtained on the No. 5100 with a Walschaert valve gear and 12-in. valves, and on the No. 5200 with a Baker long-travel gear and valves of the same diameter. The main and side rods are of carbon-vanadium steel. The crossheads are underhung and, in the case of the No. 5100 work in multiple-bearing guides. Floating bushings for both the main and side rods are used on the main crank pins.

Table Showing the Principal Dimensions and Weights of the Lehigh Valley 4-8-4 Type Locomotives

Railroad	Lehigh Valley	
Builders	Baldwin Loco. Works	American Loco. Co.
Type of locomotive	4-8-4	4-8-4
Road number	5100	5200
Road class	T-1	T-2
Service	Fast freight	
Maximum tractive force	66,400 lb.	66,700 lb.
Tractive force, booster	18,360 lb.	18,360 lb.
Tractive force, starting	84,760 lb.	85,060 lb.
Weight on drivers ÷ tractive force	4.02	4.07
Cylinders, diam. and stroke	27 in. by 30 in.	26 in. by 32 in.
Valve gear, type	Walschaert	Baker
Weights in working order:		
On drivers	270,000 lb.	268,000 lb.
On front truck	55,000 lb.	65,200 lb.
On trailing truck	83,000 lb.	88,800 lb.
Total engine	408,000 lb.	422,000 lb.
Total tender	366,200 lb.	358,800 lb.
Total engine and tender	774,200 lb.	780,800 lb.
Wheel bases:		
Driving	19 ft. 3 in.	19 ft. 3 in.
Rigid	12 ft. 10 in.	12 ft. 10 in.
Total engine	45 ft. 1 in.	45 ft. 7 in.
Engine and tender	94 ft. 10½ in.	95 ft. 5½ in.
Wheels, diameter outside tires:		
Driving	70 in.	70 in.
Front truck	33 in.	33 in.
Trailing truck, front	42 in.	36 in.
Trailing truck, back	42 in.	45 in.
Boiler:		
Steam pressure	250 lb.	255 lb.
Fuel, kind	Soft coal	
Diameter, first ring, inside	86 in.	84¼ in.
Firebox, length and width	132⅛ in. by 96¼ in.	132⅛ in. by 96¼ in.
Tubes, number and diameter	77—2¼ in.	77—2¼ in.
Flues, number and diameter	202—3½ in.	202—3½ in.
Length over tube sheets	21 ft. 6 in.	21 ft. 6 in.
Grate area	88.3 sq. ft.	88.3 sq. ft.
Heating surfaces:		
Firebox and combustion chamber	490 sq. ft.	508 sq. ft.
Tubes and flues	4,932 sq. ft.	4,933 sq. ft.
Total evaporative	5,422 sq. ft.	5,441 sq. ft.
Superheating	2,256 sq. ft.	2,243 sq. ft.
Comb. evap. and superheat.	7,678 sq. ft.	7,684 sq. ft.
Tender:		
Water capacity	18,000 gal.	18,000 gal.
Fuel capacity	28 tons	28 tons.

Lubrication

Each locomotive is equipped with a Nathan type DV mechanical lubricator having 14 feeds and a capacity for 24 pints of oil. Two feeds run to the cylinder barrels, two feeds to the steam pipes and two to the guides. One feed extends to the air compressor, one to the stoker and one to the feed-water heater pump. Four feeds run to the driving boxes and one to the atomizer which takes care of the throttle, booster and drifting valves. Dividers for splitting the feeds to the driving boxes are of the railroad's design.

The main crank pins and crosshead wrist pins are grease lubricated and Spee-D lubrication is applied to the back end of the eccentric rod. Oil lubrication is used for the front ends of the main rods.

Alemite grease fittings are applied to the motion work, spring rigging, center plates and chafing castings, gear housing for the stoker, front and back trailing-wheel hubs, end surfaces of the engine-truck bolster, engine- and trailing-truck pedestal surfaces, trailing-truck radius-bar fulcrum, throttle rigging and shoe and wedge surfaces of the driving boxes. The brake rigging has Alemite lubrication as follows: Bell crank at the brake shaft, top brake-hanger pins, brake-head pins, and brake beams at the hangers. The application of grease fittings to the valve gear do not extend beyond the reach-rod connection to the reverse gear.

The Tenders

The tenders have Commonwealth one-piece frames of the water-bottom type. The tanks are built with welded seams. The trucks are of six-wheel design, with the Bethlehem auxiliary locomotive applied to the two pairs of front wheels of the rear truck. The tenders have a capacity for 18,000 gal. of water and 28 tons of coal. The coal bunkers are constructed with concave sides, causing coal to flow freely into the stoker trough.

A Railroad Umpire Would Remedy Many Major Ills

(Continued from page 668)

earnings of the carriers for their own benefit, they will soon cease their efforts in that direction. Then there will arrive the day of peace and glory—unless some other troubles arise.

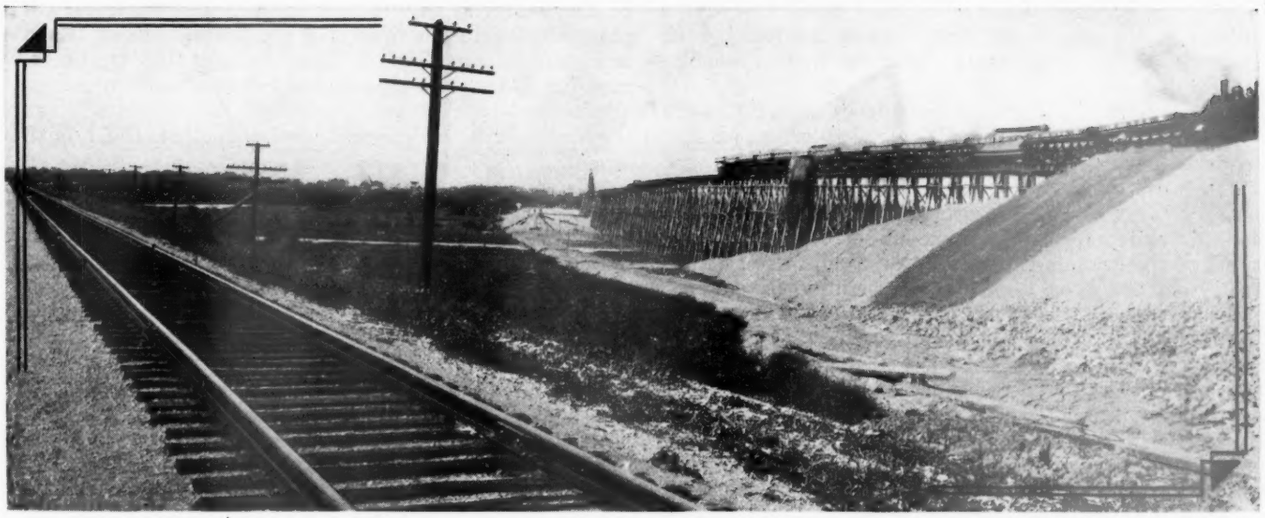
Everything that Bureau 1, "the rate bureau," would do would be subject to review by the I. C. C. Bureau 2, public relations, would be merely a distributor of information and if not properly conducted would be subject to severe reprimand by public opinion. Bureau 3, on competitive wastes, could only effectively economize under the strong light of public opinion and the most important of its activities would be subject to the approval of the state commissions.

Interfering With Management?

Some believe that the inauguration of an umpire would mean a considerable abdication on part of railway directors and officers of their duties and responsibilities. This is correct only to an infinitesimal extent. The umpire could deal only with rates and competitive waste in the interest of all the railways as a whole. Officers of individual railways should certainly feel secure that the umpire and the committee of experienced railway executives or "elder statesmen" to whom they would have the right of appeal would always deal fairly by them and protect them against any possible snap judgment.

The mere nomination of an umpire would greatly stimulate railway credit. It would tend to restore the confidence of railway stockholders in the permanent security of their investment. Such stockholders, many of whom now fear further reduction or cessation of dividends, would unloosen their purse strings and set money into circulation for thousands of things. Nothing would be as helpful toward restoring general confidence in the business situation as the restoration of railroad credit!

Criticism and suggestions are urgently requested.



A View From the Old Line Looking West Toward the River

Four-Mile Line Requires Three Million Yards of Fill

Santa Fe relocation project also includes a new bridge over the Illinois river and four grade-separation structures

MODERN grading methods have been utilized on a large scale to place the 3,000,000 cu. yd. of embankment required in the line-relocation project which the Atchison, Topeka & Santa Fe is carrying forward near Chillicothe, Ill. This project, which involves the relocation of about four miles of double-track line and the construction of a new bridge across the Illinois river, was undertaken for two principal reasons. One is to replace the old single-track bridge, which has a swing span, with a double-track, fixed-span bridge sufficiently high to clear river traffic, and the other is to eliminate a combination of grades adjacent to the old bridge which are particularly unfavorable to westbound traffic.

Furthermore, this project may be considered as a step in a proposed program of grade and line improvement which ultimately contemplates the reduction of the ruling grade on the Chicago-Kansas City line of the Santa Fe from 0.8 per cent to 0.3 per cent, excepting a short pusher grade of 1.1 per cent just west of Chillicothe.

An Unusual Situation

The Illinois river crossing of the Santa Fe presents some unusual conditions, owing in part to the topography of the flood basin of the river. The river proper is situated near the west extremity of the flood basin and flows roughly in a southerly direction. The ground slopes from the east to the bank of the river at an average rate of about seven feet per mile. On the west side of the river the basin is of a similar nature, with the exception of a 50-ft. bluff which rises almost vertically a mile back from the river.

The Chillicothe freight yard lies on the bluff and in order to reach this elevation from the east without resort to excessive grades in the original alinement, it was necessary to commence the ascent about 4,000 ft. east of the river bridge or on the side of the river opposite the bluff. East of this point the present grade is practically level for several miles, while to the west it rises on about a 0.5 per cent grade to the east end of the bridge, is level across the bridge and then rises again on a 0.5 per cent grade from the west end of the bridge to a point slightly beyond the edge of the bluff. Owing to these conditions, this bridge, although containing a swing span, is nearly 20 ft. above high water and almost 45 ft. above low water, the maximum height of the embankment being more than 20 ft. on the east side of the river and about 40 ft. on the west side. In order to make a 90-deg. crossing of the river in the original alinement, it was necessary to introduce a long two-degree curve at each end of the bridge.

The existing bridge at this point is a single-track structure having a total length of 1,501 ft. It consists of six through-truss spans, five deck plate-girder spans and a 305-ft. through-truss swing span to allow for the passage of river traffic.

River Traffic a Factor

Although traffic on the Illinois river is not now of sufficient density to interfere to any considerable extent with train operation, the proposed project of the government to deepen the channel to nine feet has introduced the possibility of an increase in this traffic, with a consequent adverse effect on railway traffic if the movable span is not replaced with a fixed span. Incidentally, a fixed-span bridge will eliminate all expenses incident to the maintenance of an operator at the bridge at all times.

In addition, greater efficiency in the operation of trains through this territory will be rendered possible by the replacing of the single-track structure with a double-track bridge.

The combination of grades and curves adjacent to the old bridge, together with the 10-mile slow order, present a condition which places a definite limit on the tonnage rating of westbound locomotives operating through this territory. Trains must approach the bridge from the east at a limited speed and are required to commence the ascent of the grade on the west side of the river with a greatly reduced momentum. This condition is rendered more serious by the fact that this grade is on the approach to the Chillicothe freight yards.

In order to overcome the foregoing obstacles to efficient train operation, it was decided to relocate about four miles of line adjacent to the river and to construct a fixed-span bridge with a clearance about 31 ft. greater than the old bridge. On the relocated line, the entire elevation is secured on the east side of the river, thus giving a level grade west of the bridge on the approach to the freight yard.

Description of the Project

At each extremity of the project the relocated line parallels the old line for a distance of almost a mile from the point of connection, connecting with a 1½-mile tangent by a short one-degree curve. The new bridge is situated approximately in the middle of the tangent. The length of the old line within the extremities of the project is 22,144 ft., while the length of the new alinement is 21,530 ft., a reduction of 614 ft. At the east end of the project, where the two lines are parallel, the distance between the eastbound main line and the new westbound main line is 83 ft., while at the west end this distance is about 175 ft. On the east side of the river the new line is north of the old line and on the west side it is south, the two lines crossing above the river at an angle of 20 deg. 24 min. An interesting fact in regard to this project is that the main span of the new bridge will be situated directly above the movable span of the old bridge.

About 3,000 ft. west of the new bridge a double-track freight line leaves the main line to connect with the east end of the classification yard. To facilitate movements to and from this yard, No. 20 crossovers are to be provided at the point of connection and all turnouts are to be equipped with power switches which will be controlled from the despatcher's office in the Chillicothe station. The alinement of the connection is such that it will be necessary to shorten the yard about 650 ft. at the east end.

Between the connection of the freight and passenger lines and the Chillicothe yard, and about 4,500 ft. west of the west end of the new bridge, the two lines will pass over the Peoria branch of the Chicago, Rock Island & Pacific. In addition to the structures that are necessary for these grade separations, two others are required, one under the new passenger line for an interchange track with the Rock Island, and the other for Fourth street.

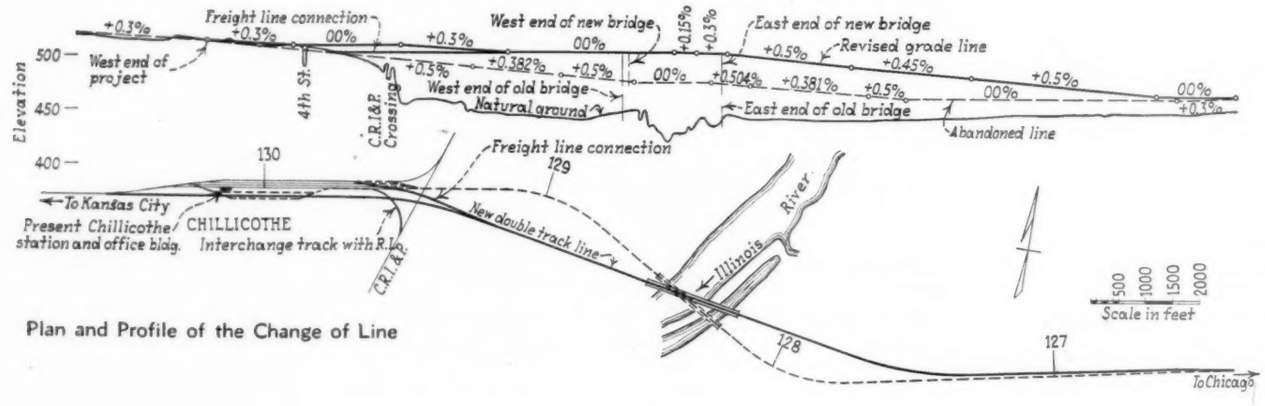
The New Grade

At the connection of the old and new alinements at the east end of the project, the grade of the old line is practically level, whereas the relocated line commences almost immediately to ascend on a 0.5 per cent grade which continues almost unbroken to the east end of the bridge. From the west end of the new bridge the grade is level for about 2,300 ft., beyond which point it is alternately level and 0.3 per cent upward to the end of the project. At the east end of the yard the revised grade line is about five feet above that of the yard and to make the connection the freight track will then descend on a 0.3 or 0.4 per cent grade. With the elimination of the 0.5 per cent grade on the approach to the freight yard and the slow order on the old bridge, it is expected that it will be possible to increase the loading of westbound freight trains by about 250 tons or to a tonnage of 4,550.

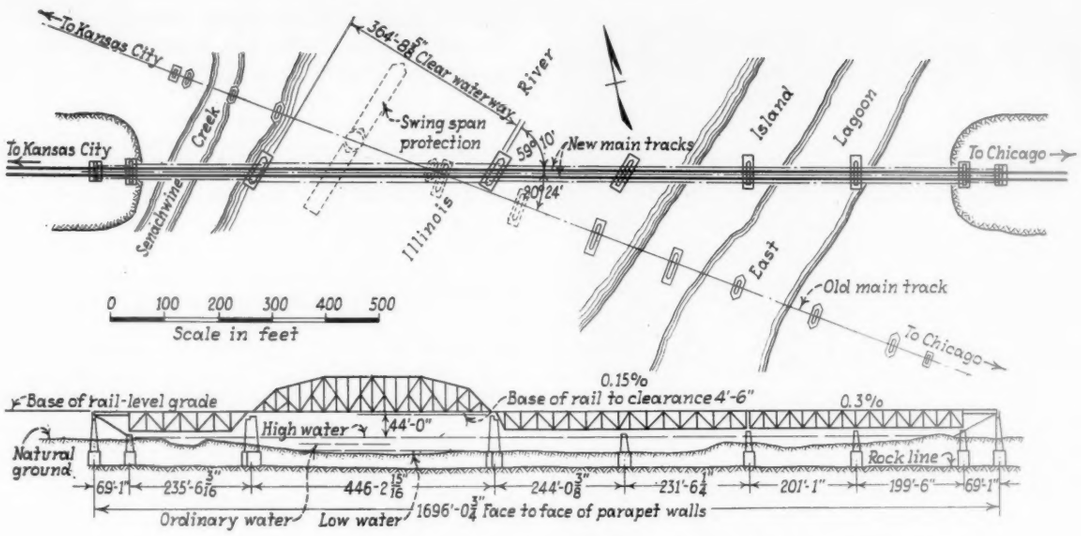
The New Bridge

The new bridge, which is now under construction, will be 1,696 ft. long and will consist of a 68-ft. 7-in. deck plate-girder approach span at each end, five deck truss spans rangi 'g from 199.5 ft. to 223.5 ft., in length, and a 440-ft. fixed through-truss main span, all supported on reinforced concrete piers. The main span will have a clearance of 44 ft. above high water and about 65 ft. above low water. Although the main span of the new bridge will be 31 ft. above the old structure, its bottom members will be about three feet below the top members of the swing span, thereby introducing a difficult problem of erection. This situation is further complicated by the small angle made by the crossing of the two spans, and the consequent large number of members of both spans that are involved.

In view of these conditions it was necessary to adopt an unusual expedient to facilitate the erection of the main span of the new bridge and to avoid interference with traffic passing over the old bridge during this operation. The plan is to erect the main span about four feet higher than its ultimate position in order to clear the old span. The added elevation is to be secured by supporting the span on a grillage of rails at each pier. The near ends of the adjacent spans are to be brought up to the level of the main span in the same manner so that the track may be used for construction purposes during erection.



Plan and Profile of the Change of Line



Plan of the River Crossing and Elevation of the New Bridge

When the erection of the bridge is completed and the new line is ready to receive traffic, the swing span of the old bridge is to be swung about to the open position and allowed to rest on its protecting structure. In this position the interfering top members of the swing span will be burned through and removed so that the upper span may be lowered to its final position. The lowering operation is to be accomplished by utilizing hydraulic jacks, the layers of rail in the grillages being removed one at a time. It is estimated that only six hours will be required between the time traffic is suspended on the old line until it will be resumed over the relocated line. The contract for the erection of the superstructure of the steel work has been awarded to the McClintic-Marshall Company, Chicago.

The reinforced concrete piers of the new structure, of which there are nine, were carried down to solid rock. The piers supporting the deck spans have an average total height of about 65 ft. while those at each end of the main span are about 95 ft. high. The abutment piers, which are of the buried type with two reinforced concrete shafts to transmit the load to the footing, have an average total height of about 100 ft.

3,000,000 Cu. Yd. in 16 Months

Work on this project was commenced in March, 1930, and is expected to be completed by next July. The completion of the project within this limited period hinges primarily on the speed with which the 3,000,000 cu. yd. of embankment is placed. The plan was to push the work on both sides of the river with all possible speed, although special effort was made to complete the embankment on the west side up to the west bridge abutment by December 1 so that the erection of the superstructure of the bridge could proceed from that point while the river is closed to traffic.

The List Construction Company, Kansas City, which has the contract for placing the entire embankment, introduced on this project a large amount of the most modern grading and excavating equipment. The progress of the work has been scrutinized closely to preclude the possibility of delay. This company divided its forces into two units, one handling the work on the east side of the river and the other the work on the west side, which is now completed. In addition, a contract was sublet by this company to the LaCrosse Dredging Company, Minneapolis, Minn., for placing the base of the embankment with material dredged from the river bottom.

On the west side of the river the embankment has a maximum height of about 62 ft. and for a distance of approximately 4,500 ft. from the end of the bridge an average height of about 50 ft. On the east side of the river the embankment ranges in height from 14 ft. at the eastern extremity to about 60 ft. at the end of the bridge. The embankment requirements are divided about equally between the two portions of the project, or about 1,500,000 cu. yd. on each side of the river.

Dredging Operations

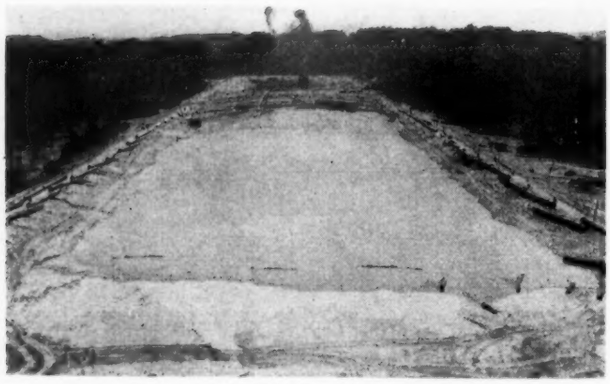
A total of about 830,000 cu. yd. of the embankment was placed by dredging. This material constitutes the base of the embankment and is divided about equally in quantity between the two sides of the river. The base thus formed is 2,400 ft. long and about 20 ft. high on each side of the river. The dredged material consists of gravel, sand and shells and forms a firm, solid support for the top course. This material was conveyed from the river to the desired location in 12-in. pipe lines. By working the dredging equipment two 10-hr. shifts a day, between 4,000 and 5,000 cu. yd. of material was placed by this method daily. The dredging operations were confined entirely to the west side of the river until that portion of the work was completed and were then transferred to the east side.

Operations West of the River

Material for the remainder of the embankment on the west side of the river was taken from two major sources and required the use of various types of excavating and hauling equipment. One of these sources was the stripping from a gravel pit south of the tracks in the angle formed by the intersection of the Sante Fe and Rock Island lines. The other was a borrow pit located about three miles west of the bridge on railroad property.

The first of these sources yielded about 365,000 cu. yd. of material and the second about 700,000 cu. yd. In addition, about 60,000 cu. yd. was obtained from the station grounds where the change of line necessitated considerable excavation in the rear of the present station and office building.

From the intersection of the Santa Fe and the Rock Island to a point 700 ft. east, the embankment was raised



The Uncompleted Dredged Fill West of the River

practically to grade from material taken from the gravel pit. This material was hauled in 3-cu. yd. motor trucks and 7-cu. yd. Western crawler dump wagons hauled by caterpillar tractors, the number of units in service varying from four to six of the former and from two to four of the latter. From the east end of this section of the embankment to the west end of the dredged material, a distance of about 1,500 ft., the embankment was raised to the level of the dredged section by means of a narrow-gage trestle. This section varied in height from 8 ft. at the west end to 22 ft. at the eastern extremity.

The material for this section was taken from the gravel pit and was hauled in Western 5-cu. yd. narrow-gage dump cars which were loaded with a Bucyrus-Erie 50-ton caterpillar-type steam shovel. The yardage of material that was taken from the gravel pit was divided about equally between that hauled by the motor trucks and dump wagons and that dumped from the narrow-gage trestle.

When the embankment west of the western extremity of the narrow-gage trestle had been brought up to grade, construction on a standard-gage trestle directly over the site of the narrow-gage trestle was commenced. The second and final raise of the embankment west of the river was made from this trestle, which extended to the river. The material for this raise was obtained from the extreme western borrow pit, from which it was hauled in 12 and 16-cu. yd. Western dump cars in trains of about 15 cars each. Three 70-C Bucyrus railway-type shovels were maintained at this borrow pit, although only two of these were in use at any one time. During the peak of the operations a Bucyrus 50-B railway-type shovel was also used here.

All of the material for the embankment east of the river, with the exception of that which was dredged from the river bottom, was hauled from a borrow pit about 4,000 ft. east of the eastern extremity of the project. This pit is also located on railway property. The excavating equipment here included a 91-ton, 5-cu. yd. capacity Marion steam shovel, a 1¼-yd. Northwest dragline and a 1¼-yd. Lorain shovel. Western, standard-gage, 12 and 16-cu. yd. capacity dump cars were also used on this side of the river. Nine standard-gage steam locomotives were employed by the contractor on the project, four on the east side of the river and five on the west side.

One of the East Borrow Pits Showing the Strata of Blue Clay

The original plan at this location was to obtain a large proportion of the material from a high hill, as this source offered several advantages as compared with going into level ground for the material. However, after nearly a half million cubic yards of material had been removed and as the work progressed into the heart of the hill, a stratum of blue clay was encountered which proved to be unsuitable for embankment material. Excavating operations were then transferred to the level ground nearby where 10 test holes excavated by the dragline indicated the existence of a satisfactory mixture of sand and gravel to a considerable depth. Owing in part to the porous nature of the material in both the east and west borrow-pits and to the existence of an underlying stratum of gravel, no difficulties were caused by the accumulation of water.

The movement of material from the east pit in a 10-hr. day ranged between 3,600 and 4,000 cu. yd. During June, when all the various forms of equipment, as outlined above, were in operation simultaneously on both sides of the river, the total quantity of material placed in the embankment amounted to 476,000 cu. yd. and even this large yardage could have been increased considerably by the introduction of additional night shifts without increasing the total amount of equipment.

In the construction of the standard-gage pile trestle on each side of the river, ample precautions were taken to avoid the possibility of delay to the work through defects in the trestle. These trestles had an average height of 35 ft. and were constructed practically to grade. The pine piles ranged in length from 45 ft. to 65 ft., and were driven to a penetration of from 15 to 20 ft. A Nordberg track shifter is utilized to raise and shift the track. In spite of the swamp-like nature of the ground in this vicinity, little trouble has as yet been caused by the sinking of the embankment.

Drainage Canal Supplies Riprap

In order adequately to protect the embankment from the river during high water, it is planned to place about 100,000 cu. yd. of riprap along the base of the fills throughout their entire length. Material for the riprap is being obtained from the spoil banks of the Chicago drainage canal at Lockport, Ill., which consist largely of limestone. An interesting expedient has been adopted for the proper placing of the riprap. A berm is constructed at the proper distance above the toe of the embankment on which is placed a temporary track from which the riprap is dumped. The riprap is then spread and shaped to the desired section by means of a Jordan spreader.

As has been mentioned before, the old bridge crosses the river at approximately right angles and the new bridge makes an angle of 20 deg. 24 min. with this alinement, thus departing considerably from a right-angle crossing. However, only the main span and the deck-truss span immediately to the east of this span are skewed, the piers making an angle of 59 deg. 10 min. with the center line of the bridge, while all other piers are at right angles to the center line of the track. All of the piers were sunk as far as practicable by open-

caisson methods, compressed air then being utilized to sink them the remainder of the distance to solid rock.

Concreting Facilities

Concrete for the piers was mixed in a central plant at the east end of the bridge and transported to the point of disposal in bottom-dump buckets of 1.2 cu. yd. capacity, which were carried on a narrow-gage flat car hauled by a dinky engine. A crane was used to lift the bucket from the car and to suspend it over the form while it was being dumped. An advantageous feature of these buckets is the fact that the concrete can be dumped in any quantity desired.

The narrow-gage track is supported on a pile trestle and since it was not permissible to obstruct the main channel of the river, which at this point is near the west bank, it was necessary to terminate the narrow-gage line near the east end of the old swing span. From this point the concrete was transported to the piers on the west side of the main channel on a barge ferry.

The restricted surroundings in which it was necessary to set up the concrete mixing plant required the adoption of a layout containing some unusual features. The elevated material hopper was located on the south side of the track and the mixer was on the north side. Material in the proper proportions was dumped from the hopper into a cart which was wheeled across the track on an elevated platform. The material hopper was filled from the material piles by a stiff-leg crane which was supported on a framework of timber piles. The concrete mixer had a capacity of 1.2 cu. yd. and an average of 300 cu. yd. of concrete was placed in a day. The Union Bridge Company, Kansas City, Mo., held the contract for constructing the substructure.

The Fourth Street Subways Under the New Main Tracks (foreground) and the Yard Tracks

Four Grade-Separation Structures

A total of about 21,000 cu. yd. of reinforced concrete was required for the entire project, including the four grade-separation structures near the east end of the Chillicothe freight yard. This group of structures represents a sizable project in itself. At present the Rock Island line at this point is single-track, but, to provide for the future, the grade-separation structures under the two double-track lines of the Santa Fe were designed with sufficient capacity to carry four tracks. Each of these structures is a 71-ft. girder span on concrete abutments with ballast-deck pile trestle approaches. The grade-separation structure for the interchange track with the Rock Island, which curves under the new passenger main line, and the subway under the passenger line at Fourth street are similar though smaller structures with concrete abutments and wing walls, without approaches. The concrete requirements of these four structures amount to about 4,100 cu. yd.

The project is being carried out under the general supervision of H. W. Wagner, chief engineer of the Eastern lines of the Santa Fe, and B. H. Newlee, assistant engineer, is in direct charge of the entire project.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended March 21 showed a gain of 7,680 cars as compared with the week before, amounting to 741,942 cars. This was a decrease of 133,443 cars as compared with the corresponding week of last year and of 220,458 cars as compared with 1929. Loading of grain, livestock and coal, however, showed increases as compared with last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week Ended Saturday, March 21, 1931

Districts	1931	1930	1929
Eastern	171,492	199,441	228,713
Allegheny	148,066	180,089	200,396
Pocahontas	42,188	46,842	49,661
Southern	123,474	142,042	150,360
Northwestern	86,392	108,087	115,351
Central Western	107,987	125,459	137,617
Southwestern	62,343	73,425	80,302
Total Western Districts	256,722	306,971	333,270
Total All Roads	741,942	875,385	962,400
Commodities			
Grain and Grain Products	38,634	37,657	42,111
Live Stock	21,458	21,241	26,046
Coal	127,971	126,819	136,490
Coke	7,995	9,700	12,216
Forest Products	33,963	58,400	68,396
Ore	5,916	10,043	11,886
Mdse. L.C.L.	222,227	251,445	263,415
Miscellaneous	283,778	360,080	401,840
March 21	741,942	875,385	962,400
March 14	734,262	881,308	958,601
March 7	723,534	873,716	947,539
February 28	682,000	899,498	978,201
February 21	713,938	827,560	905,503
Cumulative total, 12 weeks	8,525,960	10,383,860	11,184,332

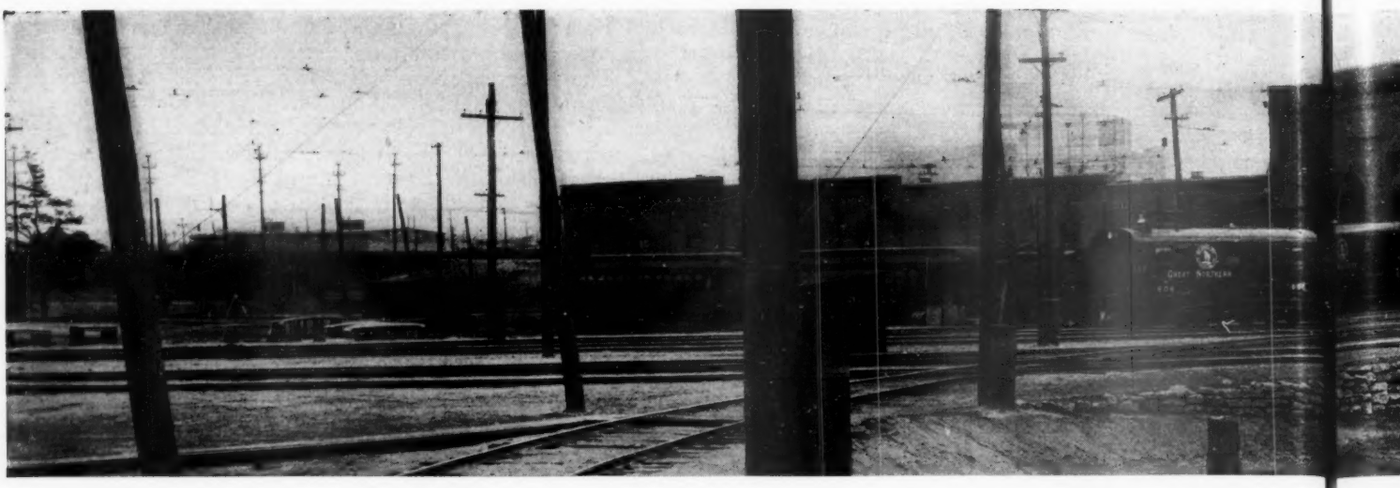
The freight car surplus for the week ended March 15, averaged 626,890 cars, a decrease of 16,107 cars as compared with the preceding week. The total included 307,298 box cars, 247,386 coal cars, 32,294 stock cars and 14,957 refrigerator cars.

Car Loading in Canada

Revenue car loadings at stations in Canada for the week ended March 21 totaled 49,661 cars, an increase of 1,444 cars over the previous week but a decline of 9,408 cars from the same week last year.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
March 21, 1931	49,661	30,016
March 14, 1931	48,217	29,011
March 7, 1931	48,106	29,338
March 22, 1930	59,069	36,402
Cumulative Totals for Canada		
March 21, 1931	558,379	334,948
March 22, 1930	682,605	441,246
March 23, 1929	743,856	516,883

THE BALTIMORE & OHIO has established additional sleeping car service between Chicago and Wheeling, W. Va., cars leaving Chicago at 10 p.m. and arriving in Wheeling at 2:35 p.m. the next day.



Shops of the Spokane, C Alene &

Twenty-Four Years' Operation on the Spokane, Coeur D'Alene & Palouse

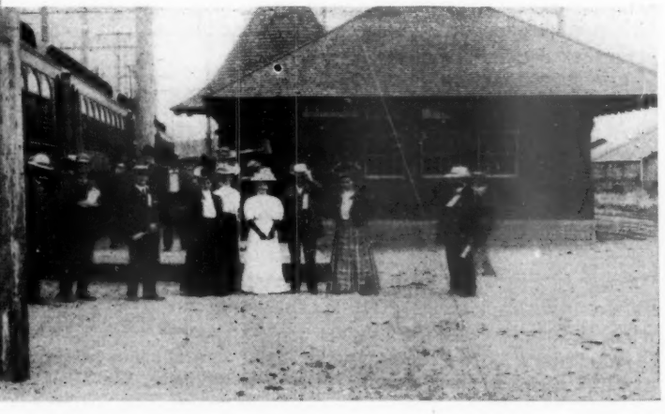
Old Inland Empire System, now owned by the Great Northern, operates single phase electric equipment with 96.5 per cent availability

By A. J. Mayham

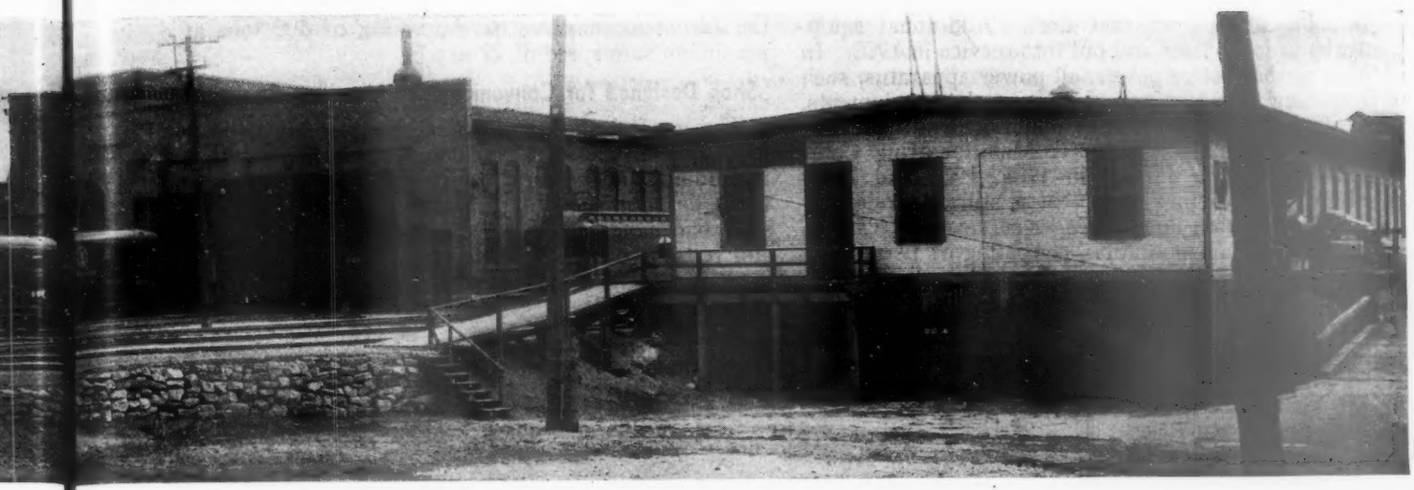
Mechanical Superintendent, Spokane, Coeur D'Alene & Palouse

THE Spokane and Inland Empire Railway Company commenced operation in the early part of 1906. The first single phase road in this country had been put into operation only two years before; therefore, the Inland Empire System was one of the pioneer single phase installations. The results being obtained today, after twenty-four years' operation, show the wisdom and foresight used in the selection of the equipment.

The lines of the Inland Empire System extend from



A Picture Taken 24 Years Ago on the Moscow Line



kane, C Alene & Palouse at Spokane, Wash.

Spokane, Wash., to Moscow, Idaho, a distance of 104 miles, including sidings and turnouts. A branch line from Spring Valley extends 42 miles to Colfax, Wash. These lines traverse a rolling country rich in orchards and wheat fields. At Palouse a railway from the Bitter Root mountains to the east taps what is claimed to be the largest stand of white pine timber in the world. The most severe grade condition exists immediately after leaving Spokane where there is a continuous grade of approximately eight miles, with a maximum of two per cent.

Simplicity of Distribution System

The electrical distribution system of the single-phase line is a simple one. Power is purchased from the Washington Water Power Company at Spokane at 60,000 volts, 3 phase, 60 cycles. It is transformed in the Spokane frequency changer station of the Spokane, Coeur d'Alene & Palouse Railway to 45,000 volts, single-phase, 25 cycles, for the transmission line which is carried on the trolley poles. At the stations indicated on the map, which are from nine to thirteen miles apart, depending upon the profile, are located transformer stations, stepping the voltage down to 6,600 for the trolley. One of the economies of the single-phase system is that these transformer stations require no operators. Opening of a circuit breaker rings an alarm bell in the adjacent ticket agent's office or residence, and he is able quickly to restore service by reclosing the breaker.

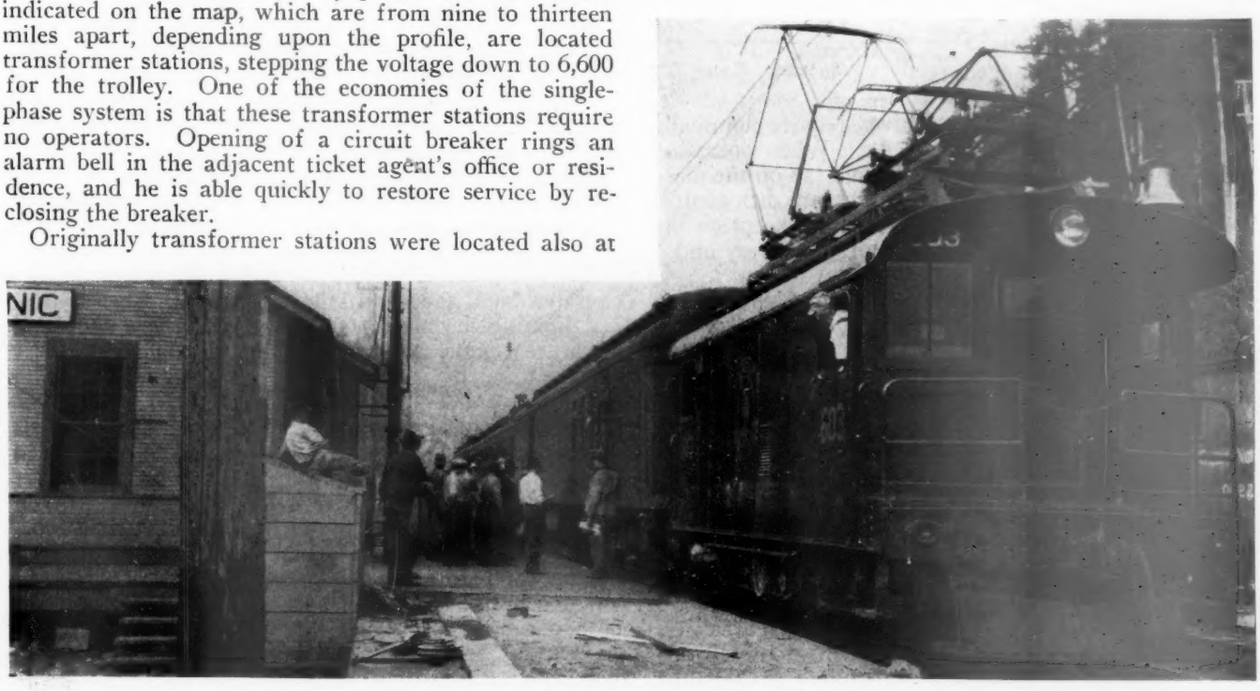
Originally transformer stations were located also at Colfax and Fairbanks, but these are found unnecessary under present traffic conditions.

The 6,600-volt trolley ends two miles from the Spokane terminal. From that point to the terminal, all operation is at 600 volts d.c. Thus all single-phase equipment must be adapted for both 6,600 volts, single phase, 25 cycles, and 600 volts, d.c. This feature necessarily adds somewhat to the maintenance costs.

At the time the a.c. electrification was started there already existed a d.c. line operating as far as Coeur d'Alene, Idaho. This line was later extended to Hayden Lake, Idaho, a distance of 40 miles from Spokane. It originally carried heavy pleasure and excursion traffic, but is now principally used for freight service to the lumber mills and allied industries.

Original Equipment Still in Service

In July, 1905, a proposal for single-phase electrical equipment was submitted by the Westinghouse Electric & Manufacturing Company. This equipment was purchased, put into service in 1906, and has been in con-



Twenty-Four Year Old S. C. & P. Locomotive Operating on Great Northern Under 11,000-Volt Contact System

tinuous operation since that time. Additional equipment was ordered later and put into service in 1908. In addition to the motive power, all power apparatus, such as frequency changers, transformer station equipments, and 6,600-volt catenary trolley material, was furnished by the Westinghouse Electric & Manufacturing Company, and put into service in 1905, 1906 and 1907. The major part of this equipment is still in service.

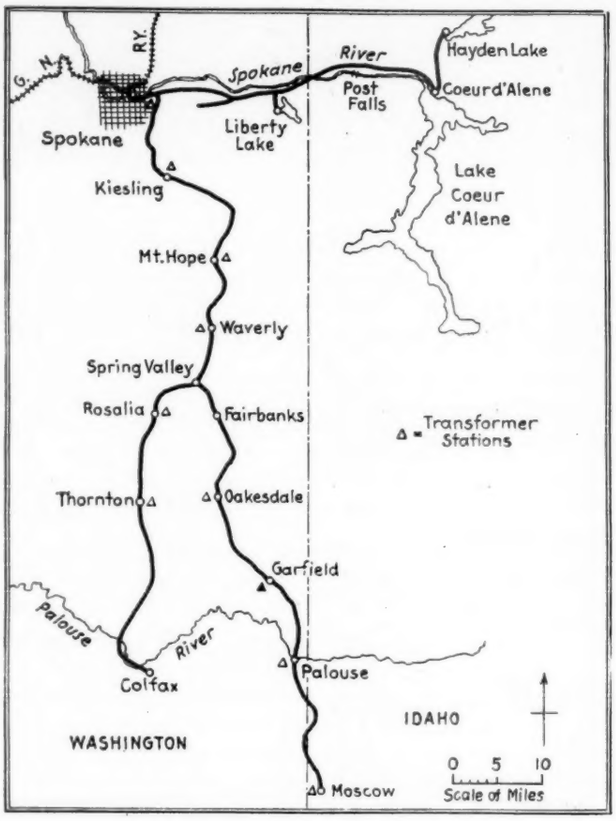
The original main line passenger service was planned as a three-car train operation, consisting of two motor cars and one trailer. This train was to be capable of making a maximum speed of 50 m.p.h. on straight level track, and 28 m.p.h. on two per cent grades. For several years the trailers have been found unnecessary, and trains consisting of two motor cars are the rule.

The single-phase multiple-unit equipments have at some time or other since 1906 been operated in every practical combination. During the earlier periods large holiday crowds and excursions were frequently handled. Trains up to six passenger cars were operated successfully. Regular passenger trains have been operated in various combinations, such as, express-baggage-passenger, U. S. mail-baggage-passenger, straight passenger trains, etc. The 50-ton locomotives have also been used in passenger service on special occasions.

The control equipment is of the electro-pneumatic unit switch type, arranged for operation on either a.c. or d.c. current. The magnet valves require nominally about 200 volts a.c., or 40 volts d.c. When operating on a.c. control power is obtained from a tap on the main power transformer. When operating on d.c. control power is obtained from a control resistor, except on the 72-ton locomotives, which have a storage battery and a charging motor-generator.

Each unit has a pneumatically operated pantograph for 6,600-volt a.c. operation, and a pole trolley for 600 volt d.c. operation. When changing from a.c. to d.c., a control change-over switch automatically governs the proper setting of the control circuits. The compressor and blower change-over switch is operated by air from the engineer's station. Compressor and blower motors are all of the four-pole type designed for operation on either a.c. or d.c. An emergency oil switch is provided by means of which the pole trolley may be used on a.c. lines in case the pantograph should be torn off or damaged beyond use.

The passenger cars and 50-ton locomotives have oil insulated main transformers and oil circuit breakers. The 72-ton locomotives have air blast main transformers. The rating of all 50-ton locomotives is 300 tons trailing at a maximum safe speed of 36 m.p.h., while the 72-ton locomotives have a rating of 600 tons at a maximum safe speed of 27 m.p.h.



Spokane, Coeur D'Alene & Palouse Railway

Shop Designed for Convenience of Handling Equipment

The general shop at Spokane handles all inspection and maintenance work, including general overhaul and rebuilding, and repairs brought in by the power and track departments. Also for the past two years this shop has handled a great deal of electrical inspection and repair work for gas-electric cars and other equipment sent in from the main line of the Great Northern Railway.

The general arrangement of the shop provides for segregation of the departments for each class of work. There are five main sections, each 200 feet long, and accommodating from two to four tracks, with sufficient space on either side and between tracks to allow plenty of room for workmen. Sections are separated by heavy fire walls and fire doors.

The center section is the main machine shop. It is equipped with machine tools and is used for all heavy repairs and overhauling. Heavy material, wheels and extra parts are stored in the basement beneath this aisle. Trap doors are provided so that any piece may readily be picked up by the crane.

Next to and parallel with the machine shop aisle is the inspection aisle, containing three tracks. Here both locomotives and motor cars are inspected and tested. This aisle also has an air brake testing and cleaning department and a sheet metal department.

There are three aisles running at right angles to the above mentioned aisles. One is used as a paint shop; the second for inspection of lighter equipment; and the third as a coach shop. All wood working and carpenter work is done in this aisle, and it has the necessary circle saws, band saws and other equipment.

Adjoining the machine shop are the forge shop and armature compressor, and welding rooms.

Organization of Department

The mechanical department consists of 47 employees and includes the mechanical superintendent, clerk, and three interchange freight car inspectors. In direct charge of the shop work are three foremen, two on the day shift and one on the night shift. One day foreman has charge of the machine shop, armature room, welding and forging departments. The second day foreman has charge of all inspection, wiring, paint and carpenter shops, and takes care of calling engineers for the various runs. The night foreman reports to the day foreman in charge of inspections and has similar duties. The organization includes one chief electrical

inspector, one chief air brake inspector, and one head motor and truck assembler. There are four armature winders and two armature winder helpers. The balance of the organization consists of general shop crafts. All of the department heads actually work on the equipments, except the two day foremen.

Results Obtained by Maintenance Methods

The value of any maintenance system is proven by the results obtained. These can be measured by the number of delays due to equipment failures, time equipment is unavailable for service, cost per car mile of maintenance, and mileages obtained on the various wearing parts. The tables show these figures. Data given in each case cover the last year for which they are available. Unfortunately 1926 is the last year for which detailed maintenance costs are available, but it is believed that present-day costs would be lower than those tabulated. Costs include all direct labor and material (with stores expense and overhead added to the material), shop overhead, car cleaning, inspection and superintendence. This must be remembered in comparing figures with those of other lines which may not include some of these items. Also the fact that all single-phase equipment must operate on d. c. as well, complicates the equipment and necessarily increases maintenance expense. Practically no trailers are operated, so that all mileage is motor mileage. When trailer miles are included, naturally lower costs per mile will appear.

Equipment Shows Its Adaptability

An excellent example of the flexibility of single-phase electrification is the conversion of equipment from the Spokane, Coeur d'Alene & Palouse Railway to operate on the Cascade main line electrified section of the Great Northern Railway. Two 50-ton locomotives and one motor car were so converted. The only equipment required was new transformers, circuit breakers and pantographs for the higher voltage. This equipment can now operate under either the 11,000-volt trolley of the Great Northern electrification or the 6,600-volt trolley of the Spokane, Coeur d'Alene & Palouse Railway, by merely changing taps on the transformers.

The performance of one of these converted locomotives, No. 603, was particularly remarkable. For nearly a year it hauled a local passenger train over the Cascade mountains on the Great Northern main line. The winter of 1928-1929 was an unusually severe one with protracted periods of heavy snows and sub-zero weather. In the midst of one of these periods, the eight-mile Cascade tunnel was put into service. Through all adverse conditions, this 23-year old locomotive made two trips a day over the Cascade mountains.

Increase in Capacity of Old Frequency Changers

The old frequency changers embody some interesting engineering. Originally power was purchased on a contract with rather heavy charges for peak loads. To reduce these peaks, a large storage battery was installed in the frequency changer station. The frequency changers themselves were three-unit machines, consisting of a 1,000-hp., 60-cycle Westinghouse wound rotor induction motor, a 1,000-kw. (1,340-hp.) 25-cycle generator, and a 750-hp. direct-current machine, which ran either as a motor or a generator. At times of low demand, the latter machine ran as a generator and charged the storage battery. At times of peak demand, it ran as a motor delivering power from the battery, and helped the induction motor to pull the 25-cycle generator.

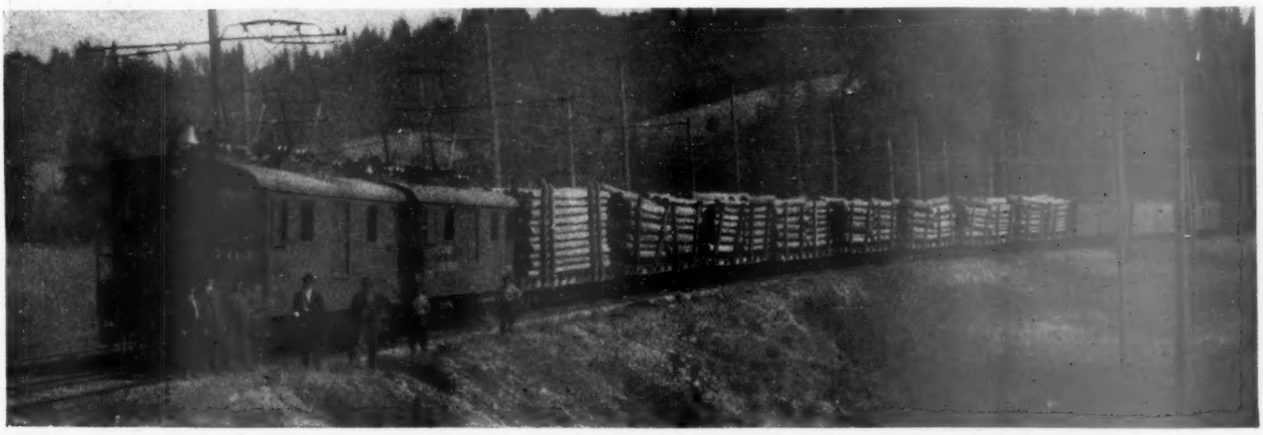
Later the railway built its own hydro-electric plant and the direct-current machine and the storage battery were removed. The capacity of the frequency changer set was thus reduced to that of the 1,000-hp. induction motor, the excess capacity in the 25-cycle generator being unavailable.

An engineering study by the Westinghouse Company showed that the 1,000-hp. induction motor had been designed so liberally that heavier copper could be placed in the stator slots, and the capacity increased to 1,500-hp. One machine has been rewound in this manner. Thus at a very small additional expense, a 50 per cent increase in power has been obtained, and the old machine is handling this increase without the least sign of distress.

Conclusion

The equipment in service today is operating with the major part of the apparatus as it was originally furnished, excepting for the expected amount of rewinding, the re-insulating and re-building of transformers. All of the type 151 single-phase traction motors and the d. c. motors are still operating with the original commutators.

At times, the snow fall on the road is relatively heavy, usually followed by a quick change to thawing weather. During the most severe conditions, all equipment has maintained a very reliable service. The a. c. control has been even more reliable than the d. c. con-



A Train of Logs on the Moscow Division

trol, and the traction motors have been about equal. Equipments showed an availability factor (days available for service divided by total equipment days) of 96.5 for the year 1929.

Special movements frequently put a severe test on this equipment. Between March 19 and April 12 of this year, only 24 days, approximately 325 cars of gravel were hauled from Spokane to near Moscow, without a single motive power failure or delay. In 1927 twenty thousand people were carried in three days from Spokane to near Parkwater for the National Air Races, and 3,500 people were carried in two round trips by one train of 10 standard Great Northern coaches hauled by two 500-class locomotives. Each autumn from 1,200 to 1,400 cars of wheat are handled in about six weeks time. In 1925 300 car loads of sand, gravel and cement were moved from Spokane to below Thornton in the midst of the wheat rush. These heavy movements would quickly show up any weaknesses which might exist in the equipments.

It has been the thought of those in charge to build up an efficient maintenance organization and to use scientific methods in handling the work. The conditions under which the maintenance is carried on have an important bearing on the results obtained. It is believed that the spirit of co-operation which prevails among the men of the organization, including the engineers operating the equipments, has a great deal to do with its present reliable condition.

List of Equipment

LOCOMOTIVES

No.	Class	Power (*)	Weight (tons)	Motors	Gear Ratio	Wheel Diam.
2	500-1	600 V.,D.C.	48	4-West.No.121	16-59	33 in.
2	502-3	600 V.,D.C.	51	4-West.No.301-D-2	17-60	36 in.
2	603-4	6600 V., 25 cy. / 11000 V., 25 cy.	50	4-West.No.133	17-72	38 in.
2	605-6	6600 V., 25 cy.	50	4-West.No.133	17-72	38 in.
5	701-2-3					
	701-4-6	6600 V., 25 cy.	72	4-West.No.151	17-79	50 in.

CARS

No.	Type	Power (*)	Weight (lbs.)	Length (feet)	Seating Cap'y.	Motors	Gear Ratio	Wheel Diam.
1	Pass.	6600V.,25cy. / 11000V.,25cy.	98100	58	62	4-West.132	18-65	36 in.
14	Pass.	6600V.,25cy.	98100	58	62	4-West.132	18-65	36 in.
6	Expr.	6600V.,25cy.	98100	58	..	4-West.132	18-65	36 in.
	Expr. / Mail	6600V.,25cy.	88500	50	..	4-West.132	18-65	36 in.
6	Trail	.....	60000	58	62	.....	....	....
8	Pass.	600V.,D.C.	81540	58	64	4-West.121	20-55	33 in.
1	Expr. / Mail	600V.,D.C.	79600	50	..	4-West.121	19-56	33 in.
1	Expr.	600V.,D.C.	73800	41	..	4-West.121	16-59	33 in.
6	Trail	.....	54000	58	64	.....	....	....

* All 6600-V., 25-cycle cars and locomotives are arranged for operation also on 600 V., d.c.

Delays Caused by Equipment Failures

	A.-C. Equipment 1928	A.-C. Equipment 1929	D.-C. Equipment 1928	D.-C. Equipment 1929
Pantograph				
Insulator ...No.	0	1	0	0
Total Delay..	0	25 min.	0	0
Cable .....No.	0	1	..	..
Total Delay..	0	3 hr. 35 min.	..	..
Circuit				
Breaker ....No.	2	1	0	0
Total Delay..	1 hr. 0 min.	20 min.	0	0
High Tension				
Main Transformer .....No.	0	3	..	..
Total Delay..	0	5 hr. 40 min.	..	..
Switch Group..No.	1	0	2	1
Total Delay..	45 min	0	2 hr. 7 min.	45 min.
Traction				
Motor .....No.	0	2	1	0
Total Delay..	0	2 hr. 0 min.	30 min.	0
Bearings .....No.	3	2	1	2
Total Delay..	1 hr. 23 min.	40 min.	23 min.	48 min.
Air .....No.	2	1	0	0
Total Delay..	1 hr. 25 min.	15 min.	0	0
Control				
Circuit. ....No.	1	0	0	0
Total Delay..	50 min.	0	0	0
Lightning ....No.	0	0	1	0
Total Delay..	0	0	20 min.	0
Grand Total No.	9	11	5	3
Total Delay..	5 hr. 23 min.	12 hr. 55 min.	3 hr. 20 min.	1 hr. 33 min.

Maintenance Costs, 1926

Class of Equipment	Mileage	Cents per Car Mile
A. C. Locomotives	195,516	7.7
A. C. Passenger & Work Cars	623,978	4.5
D. C. Locomotives	77,604	4.5
D. C. Passenger & Work Cars	514,862	5.1
Cost of all lubricants used on all equipments, 1929. (Included in above costs.)		0.120

Mileage Obtained from Various Renewal Parts

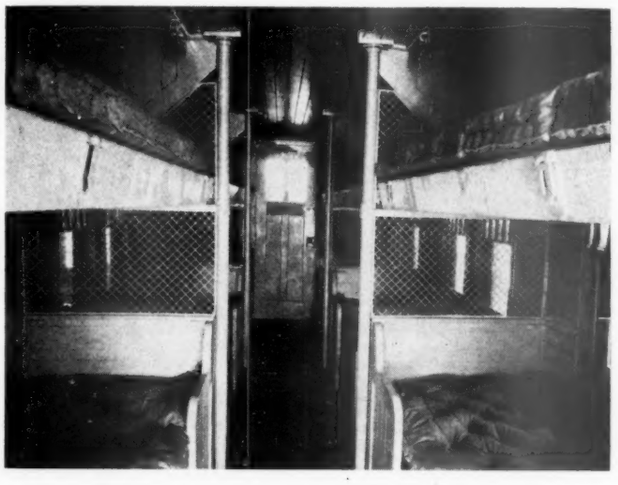
Carbon Brushes (Mileage per brush change, 1929)	
Type 132 & 133 A.C. Traction Motors	267,257
Type 151 A.C. " "	76,869
Type 121 D.C. " "	137,675
Type 301-D-2 D.C. " "	86,941
Commutators (Mileage between commutator turnings, 5-year period, 1925-6-7-8-9.)	
Type 132 A.C. Traction Motors	62,449
Type 133 A.C. " "	47,156
Type 151 A.C. " "	53,471
Type 121 D.C. " "	150,000
Type 301-D-2 D.C. " "	150,000
Pantograph Strips Mileage per strip change, all equipments, 1929	171,886
Brake Shoes Mileage per shoe change, all equipments, 1929	121,244
33-in. and 36-in. Rolled Steel Drive Wheels Average life, passenger equipments and 500 Class Locomotives—5-year period, 1925-6-7-8-9	166,412
38-in. and 50-in. Tires on Drivers Average life, 600 & 700 Class Locomotives, 1925-6-7-8-9	107,420

New Missouri Pacific Drover-Caboose Cars

TO provide added service and convenience to the shippers of livestock, the Missouri Pacific has recently placed in service a fleet of 20 new drover-caboose cars, representing an investment of $200,000. These cars, designed by the railroad and built by the St. Louis Car Company, St. Louis, Mo., will be used largely on the Omaha, Northern Kansas, Central Kansas, Colorado and Wichita divisions of the railroad. They are designed to afford modern accommodations and homelike comforts to the shipper who accompanies livestock, or to his employees, while en route.

Each car has six double seats, patterned somewhat after Pullman sleeping-car seats and affording ample seating facilities during the daylight hours of the trip. At night the seats and cushions may be pulled out, the upper berths swung down into position, and made into comfortable sleeping quarters. The cars are well ventilated. They are equipped with wash basins and toilet facilities, drinking fountains, desk-table and ample storage space for luggage. Provision is made for adequate heating during cold weather.

Safety is assured by the provision of a steel under-



Interior View of Missouri Pacific Drover-Caboose Car with Upper Berths Lowered and Cushions Arranged for Night Occupancy

Fully-Equipped Drover-Caboose Car, Recently Built for the Missouri Pacific by the St. Louis Car Company

frame of sufficient capacity to resist service shocks with an ample factor of safety. The center sills made of two 12-in., 25-lb. channels, with a ⅜-in. top cover plate, have a cross-sectional area of 28 sq. in. The buffer beams, side-sill angles, and sills and cross bearers are rigidly riveted together to form a compact structural-steel unit which is the backbone of the car. The trucks, equipped with integral side frames and 4¼-in. by 8-in. journals, have a wheel base of 5 ft. 6 in. They are of the cast steel swing-motion caboose type to promote easy riding. The wheels are 33-in. single-plate cast-iron with chilled treads.

The C. P. R. in 1930

THE net earnings (after taxes but before fixed charges) of the Canadian Pacific's railway operations in 1930 were $38,248,658—a decline of 11.3 per cent from 1929; a remarkable showing of efficiency in view of the fact that gross revenues—$180,900,804—were 13.8 per cent less than in the preceding year. Working expenses (i. e., operating expenses, taxes and other expenses excepting fixed charges) total $142,652,145—a decrease of 14.4 per cent from 1929, which reduction explains the smaller proportionate decline in net than in gross. Special income (from investments, steamships, hotels and telegraphs) in 1930 totaled $20,042,923—an increase of 31.6 per cent over 1929—and gross income was thus brought to $58,291,581—a figure almost identical with the gross income shown for 1930. Fixed charges, $19,159,864, were thrice earned. After the payment of these charges there was available $38,381,716 for dividends on preferred and common stock. Regular payments aggregating 4 per cent on the former and 10 per cent on the latter left a balance of $133,185. In 1929, when dividend payments were made at the same rate, $6,052,971 remained for surplus. The less satisfactory showing in 1930 arose from an increase in fixed charges of more than $3,000,000 and the fact that there was an increase in stock outstanding, necessitating an increase of almost $3,000,000 in dividend disbursements.

The increase in special income was due to a special distribution of surplus earnings of the Allan Line Steamship Company. Excluding taxes, the operating ratio of the railway in 1930 was 76.58 per cent as compared to 77 per cent in the preceding year.

Revenue freight traffic in 1930 totaled 12,050 million ton-miles, a decrease of 17.26 per cent from the preceding year. It is also to be noted that 1928, and not 1929, was the peak year in traffic and earnings for the C. P. R. Passenger traffic, 976 million passenger-miles, was 18.65 less in 1930 than in 1929. The average number of cars per passenger train, 7.37, and the average per freight-train, 34.28, were both slightly more than two per cent under 1929. The average revenue per ton-mile was 1.042 cents and per passenger-mile, 2.84 cents. The average earnings per passenger train-mile were $2.02 and per freight train-mile, $5.37.

The company continued its program of capital expenditures, the increase during the year in property investment in railways, hotel properties and inland steamers being $38,840,000. In addition $13,000,000 was expended upon ocean and coastal steamships. Branch line construction in Western Canada progressed—277 miles being graded, 237 miles laid with track and 360 miles were ballasted. The company's program contemplates some 148 miles additional which will be constructed as conditions warrant. Ten 4-6-4 type passenger locomotives were ordered during the year and an equal number of 0-8-0 switchers. Freight cars ordered totaled 1155 and passenger train cars, 122—this last figure being considerably greater than any similar total for any other railway on the continent last year. During the present year the company has embarked upon a program of capital improvements in excess of its immediate requirements, totaling $11,514,000, for the purpose of relieving unemployment. Under agreement with the government interest on amounts so expended is paid by the government for a period of 18 months.

Stockholders are asked to authorize an issue of $50,000,000 of ordinary stock to meet capital requirements. Stock ownership of the property at the end of 1930 was distributed as follows: United Kingdom, 58.1 per cent; Canada, 14.2 per cent; United States, 22.8 per cent; other countries 4.9 per cent.

The Canadian Pacific, plainly, is in a strong financial and physical condition but, like most other roads on the North American continent, is at the present moment sorely in need of an increase in remunerative traffic if it is to continue in the future as it has in the past to attract the funds of the investing public. An end to the present depression will doubtless witness the prompt realization of that condition.

Canadian Pacific—Revenues and Traffic

	Gross Earnings	Working* Expenses	Net Earnings†	Special Income	Fixed Charges	Dividends	Revenue Ton-Miles (millions)	Revenue Passenger-Miles (millions)
1920	$216,641,349	$183,488,304	$33,153,044	$10,966,448	$10,775,408	$29,227,276	13,856	1,718
1921	193,021,854	158,820,114	34,201,740	10,987,199	11,519,071	29,227,276	10,636	1,361
1922	186,675,035	150,373,344	36,301,691	11,092,355	13,348,905	29,227,276	12,785	1,250
1923	195,837,089	158,358,079	37,479,010	11,391,051	13,470,653	29,675,010	14,274	1,335
1924	182,502,156	145,274,914	37,227,241	9,971,252	14,070,286	29,993,340	12,428	1,221
1925	183,356,005	143,201,229	40,154,775	11,357,374	14,438,517	30,005,942	13,067	1,249
1926	198,025,591	153,080,464	44,945,126	11,056,270	14,676,358	30,005,942	13,842	1,254
1927	201,145,751	161,630,180	39,515,571	11,876,559	15,378,867	30,005,942	14,514	1,270
1928	229,039,296	177,344,845	51,694,451	12,677,683	15,308,698	33,421,179	18,059	1,318
1929	209,730,955	166,586,411	43,144,543	15,232,220	16,149,002	35,424,789	14,565	1,200
1930	180,900,804	142,652,145	38,248,658	20,042,923	19,159,864	38,248,530	12,050	976

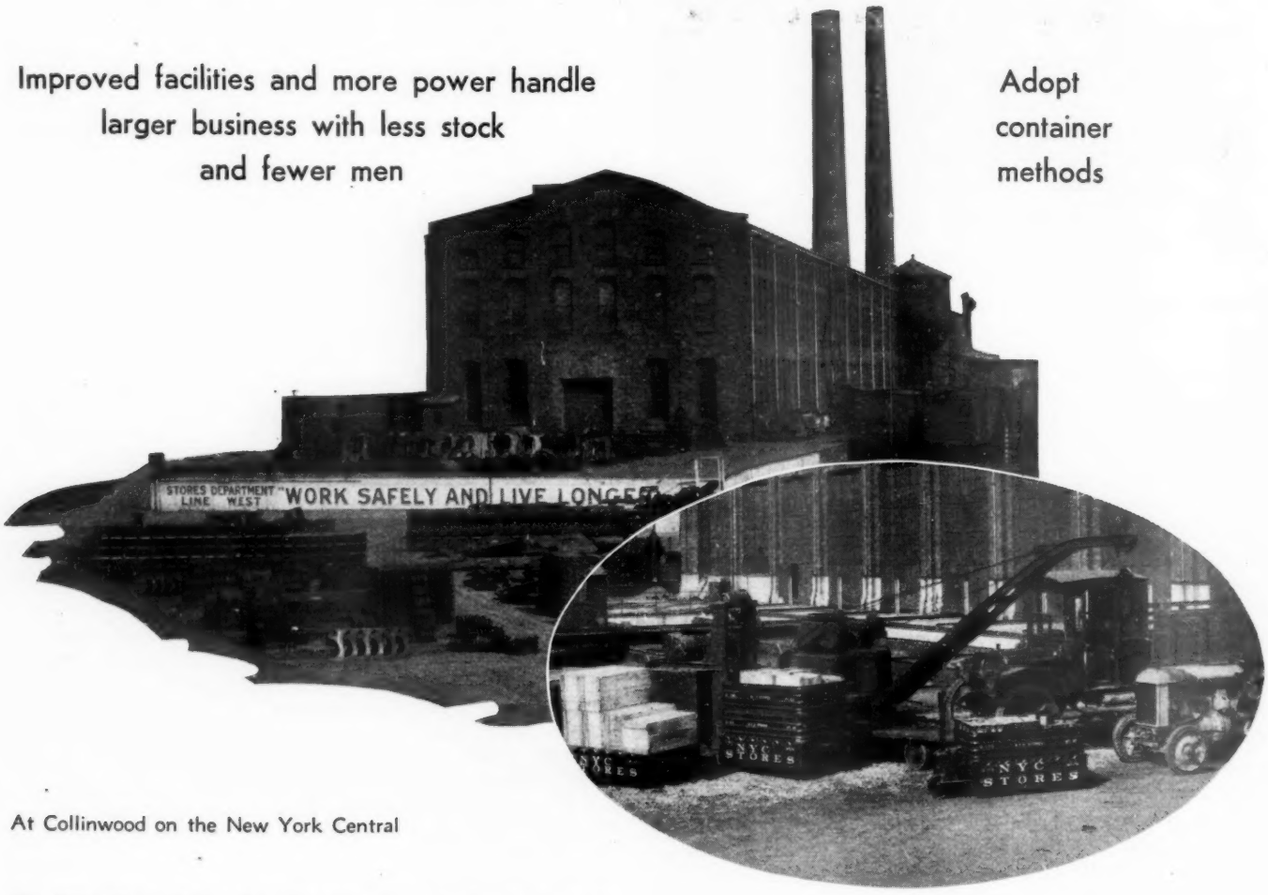
*Includes taxes. †After all deductions except fixed charges.

N. Y. C. Obtains

Better Results in Stores Work

Improved facilities and more power handle larger business with less stock and fewer men

Adopt container methods



At Collinwood on the New York Central

THE New York Central has recently purchased 11 new power lift trucks and about 2,000 skids and boxes for use in handling material at the general storehouse at Collinwood in Cleveland, Ohio, the equipment consisting of:

1 high-lift gas-electric truck
1 high-lift all-electric truck
2 low-lift all-electric trucks
1 low-lift gas-electric truck
6 hand-lift trucks
800 flat top skids
1,130 boxes for skids

The purchase of this equipment marks the introduction of large-scale container methods for handling company materials on the parent road, but is only one of several recent developments that bring the New York Central supply work into prominence. Conditions at Collinwood and Elkhart, Ind., exemplify the improvements.

Auto Trucks at Collinwood

The Collinwood plant is the general store for the lines of the New York Central west of Buffalo, N. Y., comprising the main line to Chicago and branch lines in New York state, Pennsylvania, Ohio, Michigan, Indiana and Illinois, and the lines of the Ohio Central which extend south to West Virginia. Besides supplying the large locomotive and freight car and passenger car shops at Collinwood with materials, this plant supplies directly or through nine other stores all stationery and allied supplies and all telegraph and telephone material for these lines and distributes all roadway and bridge and building material, except rail and cross ties, for the lines west as far as Toledo, while the district store at Elkhart, lying midway between Toledo and Chicago, carries the signal supplies for all the lines west from Buffalo and distributes all the track and structural materials for the territory west of Toledo, known as the fourth district of the New York Central. The average monthly consumption of material at Collinwood amounts to approximately $250,000, while the shipments from Collinwood to outside points amount to approximately $575,000.

The main store facilities at Collinwood consist of:

A general storehouse
A lumber yard and storage shed for car lumber
An iron and steel yard
A bolt and car casting storehouse
An oil and waste reclaiming plant
A locomotive casting and tire storage yard with overhead crane
A storehouse for paints and oils
Two auxiliary houses for bulk stores supplies
A yard for bridge and building lumber
A storehouse and yard for maintenance of way material

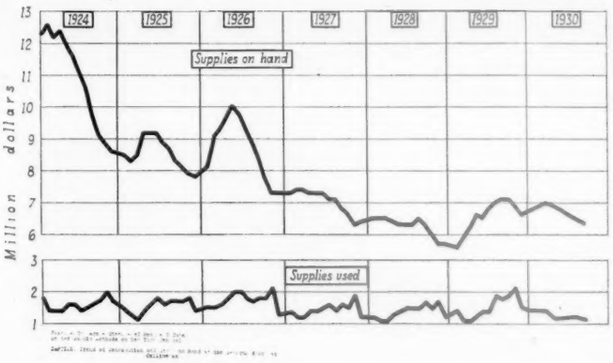
Prior to the installation of lift truck equipment, the Collinwood plant was already equipped with 23 power

machines, including several automobiles, so that the new purchases have increased the Collinwood facilities to as many as 34 power machines and 2,000 accessories, as follows:

6 steam locomotive cranes	8 power-lift trucks
1 gasoline locomotive crane	6 hand-lift trucks
7 automobile trucks	70 trailers
4 gasoline tractors	3 snow sweepers
2 gasoline crane trucks	1,930 lift truck containers

While this imposing array of mechanical devices was being developed at Collinwood, a number of important changes were made in the yards and buildings, chief among which was the revamping of the main storehouse, a structure of brick, three stories high, 60 ft. wide and 300 ft. long, which was built in 1902. Originally, the first floor of this building was brick and the material racks and shelves were all made of wood. During 1928, several building changes were made to increase the available storage space. Floors were resurfaced. Steel shelving of the daylight type was installed on the first and second floors, and the third floor was converted into a stationery store, which was also equipped with steel shelving and cabinets.

The aisleways in the buildings were enlarged to accommodate mechanical truck operation, and all small materials are stored in a special tray arrangement. The front of each tray extends downward in the form of a lip, making it possible to arrange the trays in tiers, one above the other, on portable racks. By means of these racks, several trays can be removed from the shelves at one handling, and the lips on each tray act as a guard against their being pushed beyond the supports and thereby spilling the contents.



Trend of Consumption and Stock on Hand at the General Store at Collinwood

Repair Typewriters for Whole Line

In addition to serving as a stationery store-room, the third floor also provides a central shop for the storage and repair of typewriters and other office appliances for the entire road and a space for printing and revising stock books. It is partitioned off at one end to provide an assembly room for store department clerks and stockmen who hold regular meetings under the direction of the general foremen or storekeepers.

The ten-year period from 1915 to 1925 saw an increase of 58 per cent in the total number of items carried in the

There are Wide Aisles for Mechanical Trucking

The Collinwood Store Has Been Equipped Throughout with Steel Racks

In the Way and Structures Yard at Elkhart

Which Covers 30 Acres

general store. The material-handling and office arrangement was not an economical one and by 1926 the problem at Collinwood was further complicated by the taking over of the stocks of the Ohio Central lines and the creation of a central stationery store and typewriter repair shop. The steel shelving and changes made in the buildings cost about $50,000, but the available storage space was increased 30 per cent, which made it unnecessary to extend the building, while the advantages are estimated to represent a saving of $25,000 per year.

A New Yard for Roadway Materials

The New York Central has also made substantial improvements in its facilities for handling maintenance of way materials. Improvement is evident at Collinwood, but it is particularly noticeable at Elkhart, Ind., where an abundance of space and trackage facilities available about three-quarters of a mile from the main storehouse and shops at Elkhart led the road to build a yard there of approximately 30 acres, in which all material peculiar to the bridge, building and roadway departments is handled for the territory from Toledo to Chicago.

In the Stationery Store at Collinwood

During 1929, the disbursements from this yard totalled $2,135,000, comprising $106,000 of material for the bridge department, $321,000 for the building department and $1,708,000 for the track department, while the average value of material carried in stock was approximately $240,000. Two locomotive cranes and a force of 22 men, including supervisors, are employed in this yard regularly, and a small gasoline crane and three additional men also work there when not engaged on the line of road with the supply train which is operated monthly over the entire district west of Toledo.

The new yard affords an economical and flexible layout for handling material and includes among its features a re-saw plant where second-hand or discarded bridge stringers, piling, ties, etc., received from the road, are recut into standard sizes of lumber for stock, where possible, and where large quantities of wheel blocks, car stakes and car blocking are made at small expense.

How Material Is Obtained

A unique system of office routine is followed in ordering material at these and other points on the New York Central—unique in the way it adapts familiar office methods to a co-ordinated plan of stock control for all the New York Central lines without entailing the confusion or waste of time easily possible in so extensive an operation. The methods are again illustrated by the operations at Collinwood.

Each storehouse on the lines west has a standard stock book, and a master stock book is maintained at the general store. The master book contains approximately 58,000 items covering the materials regularly required

for repairs to locomotives and cars, telephone and telegraph material, signal apparatus, and bridge, building and roadway stock, with the exception of fuel, rail, cross ties, etc.

Requisitions from the several stores calling for the purchase of supplies for replenishing stock are not rewritten in the general storekeeper's office before going to the purchasing department, but they all pass through this office where they are checked against the master books before being approved by the general storekeeper. This check affords the general office a means of determining whether the material order can be secured in part or whole from some other store in the territory instead of by purchasing.

All Lines on Exchange Basis

The general storekeeper's office receives two copies of each purchase requisition from the various stores—the original requisition and a tissue copy. When approved by the general storekeeper, the original requisition goes directly to the purchasing agent so that arrangements can immediately be made for purchasing material. If the purchase requisition is revised before going to the purchasing department, in accordance with arrangements made by the general store to supply some of the material by transferring it from other stores in the territory, these transfers are marked on the tissue copy which is then sent by the general storekeeper of the lines west to the general storekeeper of the lines east, so that the latter can mark on it any transfers it may be desirable to make from that territory. If a transfer is made, the purchasing agent is notified so that the purchase requisition can be revised before orders for material are placed with the manufacturers.

After the tissue copies of purchase requisitions made by the western lines are checked by the general stores office of the eastern lines, the tissues are forwarded to the general supervisor of stores of all New York Central lines where they are checked against reports of surplus material on each of the several New York Central lines, including the Michigan Central, the Big Four and other allied roads. If it is found that surplus material is available on any of these lines and warrants transferring after considering the several factors involved in the supply transaction, the transfer order is made and the purchasing agent, as well as the general stores office concerned, is notified.

By following this procedure on all the New York Central lines and adhering to the plan under which the tissue copies of requisitions must be checked the same day that they are received, a control is exercised over the accumulation of surplus materials without delaying the movement of requisitions from the stores to the purchasing office, since revisions of purchase requisitions made after mailing the original requisition to the purchasing department reach the purchasing department before the inquiry for prices and other office routine incident to the actual purchasing of the material is completed.

Orders received by the storehouses from the maintenance of way forces, calling for the delivery of supplies, require the approval of the proper department head before the stores are authorized to act. For example, orders for track materials are approved by the supervisor of track and the division engineer, and those for the building and bridge forces by the supervisor of buildings and the supervisor of bridges, respectively.

The order blanks require the amount on hand and the amount due on previous requisitions to be shown, as well as the amount being ordered. Two forms of order blanks are used. The form used for supply train deliveries is prepared in five copies, one for the originator of the order, another to be given to the receiver of the material when delivered by the supply train, a third for the storekeeper's file and two for the accounting department. The other form is used for carload or other direct shipments and is made in two copies, one for the originator of the requisition and the other for the storehouse file.

The General Store is Equipped with 23 Power Units for Material Handling

Requisitions made upon the purchasing department for the purpose of replenishing stores stock are usually made monthly, while special requisitions for large quantities of material to cover building and rail programs are usually prepared twice each year and are based on estimates furnished by the engineering department. It is distinctive of the maintenance of way yard operations at Collinwood, Elkhart and other points that the latter requisitions provide a delivery schedule which not only insures the delivery of the materials to the users when they require them but allows the storekeeper to reconsign a great many shipments direct to the field as they are received at the storehouse, thus avoiding much extra handling.

Inventories and Pay-Roll Reduced

The amount of business transacted by the general storekeeper at Collinwood during the past six years is shown by the following record of disbursements made directly to users or to other stores:

1924—$19,034,848	1927— 17,595,867
1925— 19,252,400	1928— 17,569,055
1926— 21,252,235	1929— 20,046,249

Without making any adjustment for a difference in price levels, these figures and also the chart indicate that the Collinwood plant is handling more work than in

earlier years. The volume of stock carried, however, is much lower than it was in 1924, while the pay-roll is also less, a condition which has largely resulted from the improvements made in facilities and equipment and better control of stock afforded under the present plan of operation. It is expected that this improvement will be substantially augmented by the introduction of the container equipment for handling and shipping certain of the materials.

The Pennsylvania's Telegraph Department

By George D. Ogden*

THE work of the Telegraph Department is for the most part unseen but it is just as necessary as that of the locomotive engineman, who is universally looked upon as a hero. Without the wires, modern railroading would be utterly impossible; with the wires the art and science have been perfected so that today the safest place in the world for a man to be is in a moving passenger train on a standard American railroad.

Today the Pennsylvania operates the world's largest privately owned telephone and telegraph system. In it are embraced over 158,000 miles of wire, 9,700 miles of pole lines, 27,700 telephones, 37,800 miles of telephone trunk circuits, 715 miles of lead sheath cable, and 141 private branch telephone exchanges. There are also in use 103 telegraph printers, tied together with 8,500 miles of circuit.

At Broad street station, Philadelphia, we have the largest railroad private branch exchange. It has 20 operators' positions, 49 trunk lines to other private branch exchanges and 100 trunk lines to public centrals, and serves 1,082 telephones. Our first telephone in Philadelphia was placed in operation in July, 1877. It ran between the old Centennial station, at Thirty-second and Market streets, to the home of Colonel Thomas A. Scott, then our company's president, who lived at Clifton, Pa., a short distance west of the city. The second circuit, built a year or two after Colonel Scott's, started at the office of the general manager, at that time Frank Thomson, in the old general offices building, 233 South Fourth Street. Thence it ran to the office of the general agent, Charles E. Pugh, in the old Centennial station, and from there to Mr. Thomson's home at Merion, Pa., not far from the Philadelphia city boundary.

Our newest and most modern telephone exchange is at Pittsburgh. This installation ties in with existing exchanges, including eight manually operated switchboards, nine full mechanical exchanges and eight semi-mechanical. With Pittsburgh as a centre, the wires reach to points as far distant as Altoona, Blairsville, New Castle, Canton, Wheeling and Uniontown. It embraces a network of 176 tie lines, over which 1,934 dial telephones are enabled to communicate without the aid of operators, except for incoming city calls or toll calls beyond the limits named. This is undoubtedly the most advanced railroad telephone installation existing.

* Mr. Ogden is assistant vice-president of the Pennsylvania. This article is taken from an address at the annual dinner of the Telegraph & Signal Department of the New York Zone, P. R. R., at the Pennsylvania Hotel, New York, March 26.

Looking Backward . . .

Fifty Years Ago

When the New York Central a few years ago laid two additional tracks between Albany, N. Y., and Rochester, making it the only four-track railway in the world, many considered the improvement a strange waste of money. Now the company has decided to extend the additional tracks from Rochester to Buffalo, making a four-track road for nearly 300 miles.—*Railway Age,* April 7, 1881.

The fine union depot built by the Pittsburgh, Ft. Wayne & Chicago [now part of the Pennsylvania] at Chicago is now completed and open for business. That road, the Chicago & Alton, and the Chicago, Milwaukee & St. Paul already run their trains into it, and the Chicago, Burlington & Quincy and the Pittsburgh, Cincinnati, & St. Louis [now a part of the Pennsylvania] will soon do likewise. The structure is built in the most substantial manner and its interior finish is costly and elegant. A great stretch of tracks, capable of holding 20 trains, is roofed with iron and glass.—*Railway Age,* April 7, 1881.

It was announced several months ago that the junction of the Southern Pacific with the Atchison, Topeka & Santa Fe would be at Deming, N. M. But when the Santa Fe completed its surveys it found there was no water at Deming, and as water is indispensable at a terminus, to supply engines, it decided to make the junction at Rio Membres, on a river 10 miles west of Deming. As there was nobody at either station to cling to the name, and as the public had been taught that Deming would be the junction station, the name of Deming was transferred to what was Rio Membres. —*Railroad Gazette,* April 1, 1881.

Twenty-Five Years Ago

F. E. Williamson, heretofore chief clerk to the superintendent of freight transportation of the New York Central & Hudson River, has been appointed car accountant, with office at New York.—*Railway Age,* April 6, 1906.

The first gasoline electric car to be used on the Vanderbilt lines has been completed by the manufacturer for the Lake Shore & Michigan Southern [now part of the New York Central]. The car is operated by a 220-hp. gasoline engine in connection with an electric generator and is designed for a speed of 65 miles per hour. The Missouri Pacific has under construction a steam motor car for passenger service which is designed to accommodate 64 passengers.—*Railway Age,* April 6, 1906.

Ten Years Ago

Traffic was resumed on the Missouri & North Arkansas on March 24 after a tieup of more than a week due to the destruction of the road's property by strikers. One train was started each way on the northern end of the line with guards on the train and special officers and citizen volunteers to prevent further destruction of bridges or other property.—*Railway Age,* April 1, 1921.

Many roads are continuing conferences with their employees regarding the matter of wage reductions, although there are few evidences in any quarter that any considerable number of the men are going to accept decreased wages without a decision to that effect by the Labor Board. Several companies, including the New York Central and the St. Louis-Southwestern, have already laid their cases before the board and many other companies will probably follow their example. Other companies have recently held conferences with their employees.—*Railway Age,* April 1, 1921.

Communications and Books . . .

Railroad Scrap

CHICAGO.

TO THE EDITOR:

Our attention was attracted to the article in your March 14 issue, entitled Railroad Scrap. In defense of those charged with the responsibility of receiving, classifying and disbursing scrap and salvageable material on the railroads, we think that the issue should be placed squarely before those officers and others who might be fostering the false impression that is conveyed in the article.

According to our way of thinking, the business depression and the decline of scrap prices have not caused a general re-study of scrap handling. The alert railroad scrap foreman, who is by far in the majority, studies prices and the nature of the scrap handled from day to day just the same as a dealer does, and decides on the most economical procedure. While there undoubtedly is some skepticism, and while, in some cases, large forces of men are employed, we believe that almost invariably it will be found that the help employed is in keeping with the work. It is no doubt true that some railroad officers are preparing attractive reports that do not entirely reflect true conditions. On the other hand, such situations are not representative of the average railroad. For that reason, all of the railroads should not be condemned.

We have had opportunities at various times to visit commercial scrap yards, and it is our thought that the smaller dealers, especially, are not nearly so well equipped as the average railroad. Many of them lack modern facilities and, from the manner in which they handle scrap, it is apparent their direct labor costs are exceedingly high. It is a fact, of course, that railroads at one time sold their scrap largely unassorted, and, while such policies were being followed, they undoubtedly lost considerable money. It is true also that the A. R. A. decided upon a number of classifications, but it is our understanding the association had the co-operation of the scrap dealers, and if it had been the consensus of opinion of these two bodies that there were too many classes, we are sure the number of items would have been reduced.

While railroads are reducing their locomotives, cars and other equipment to the appropriate classes, we think, generally speaking, this action can be justified.

Exception is taken in your article to the manner in which railroads arrive at their costs. While we know that policies vary, we believe a comparison with outside competitors would show that the representative railroad considers about the same items of expense that are considered by the dealer.

The expense of loading scrap on cars and moving the material to a centralized yard could not be considered a disadvantage, for the reason that if scrap was billed to an outside dealer, the same expense would be met. On our railway, it is the practice to sell practically all of our scrap f.o.b. our central plant, and, in that way, the cost of moving the material is paid for by the buyer. When cars are destroyed, the tonnage recovered from an average of three to five cars is included in one car, which should be to the advantage of the railroad, there being less liability than if the cars were moving on their own wheels, since there would be less units to handle. While the shrinkage in rusty material would mean a loss in freight to the railroad, it is only reasonable to assume that the buyer would take this angle into consideration when making an offer for the car as a unit.

A great deal has been said and written regarding reclamation, and, while it is undoubtedly true that some railroads are following practices which are expensive, these cases are by far in the minority. We should take into consideration the thousands of tons of material that are reclaimed and returned to service, which, in so many instances, answer the purpose of new material. In cases where the material would not be comparable with new, a proportionate valuation is usually placed upon the article.

Considering the present market as a basis, mixed scrap, within a radius of 150 miles of Chicago, would probably bring in the neighborhood of $6 to $6.50 a net ton delivered. While it is true that the price of classified scrap has reduced in proportion, the major item of scrap that is prepared by railroads is No. 1 melting steel and, on the present market, there is a differential of from $3 to $4 a ton. After deducting the cost of sorting and unloading, which in all probability would not average more than $1 to $1.25 per ton, the question that arises is: "Should the railroads take advantage of this profit, or pass it on to the scrap dealers?"

J. H. BEGGS,
Purchasing Agent, Chicago & Eastern Illinois.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Rails and Roads. "Recommendations to the Interstate Commerce Commission as to effective coordination with railroad service and proper regulation of commercial transportation made by the Association of Railway Executives." Includes statement by Alfred P. Thom, "Rail and Highway Transportation" and "Land Grant Rates and Fares" by C. S. Duncan, and statement for railway traffic executives, by R. N. Collyer, 80 p. Pub. by Association of Railway Executives, Washington, D. C. *Apply.*

Periodical Articles

The Baldwin Centenary 1831-1931. A hundred years of locomotives. Profusely illustrated. Includes also an article on the Alaska Railroad by O. F. Ohlson, "Louisville & Nashville Locomotives of Forty-Three Years Ago," "The Southern Pacific Company's New Martinez-Benicia Bridge" by Mark Noble and Malcolm K. Wright, an article on the Santa Fe 2-10-4 type locomotive, and one on motor cars for maintenance of way. Baldwin Locomotives, April 1931, whole issue.

The Brown Decades: Architecture, by Lewis Mumford. "Richardson was the first architect of distinction who was ready to face the totality of modern life; and as soon as he began to design railroad stations for the Boston & Albany line, he was already on the road to a new conception of architecture, since, search where he would, he could find nothing in the nature of a suburban railway station even dimly to remind him of other architectural solutions. In designing such a structure, one was forced either to face the elements, and work with them, or become stultified." p. 388. Scribner's Magazine, April 1931, p. 385-395.

L'Exportation des Légumes et Primeurs et la Concurrence Étrangère. Production, transport and export of fresh fruits and vegetables in France. Chronique des Transports, February 25, 1931, p. 4-9.

Is America Slowing Up? by J. J. Spengler. Not since Watt upset the centuries-old economic life of Europe by inventing the steam engine has a nation faced a revolution in economic and social life such as confronts the American people today . . . Such, in effect, is the set of conditions revealed by the recent census." p. 367. Scribner's Magazine, April 1931, p. 367-376.

When a Desert Box-Car School Tried An Activity Program. A Metamorphosed Southern Pacific box car at Edom, California and some of the unusual school activities developed around it which range from making pottery out of local clay to writing poetry about *"The Passing Freight"* (p. 133). This poem was printed in the *Railroad Telegrapher,* May, 1928. Illustrated. School Life, March, 1931, p. 131-133.

Odds and Ends . . .

Simpler Arithmetic

To the New York Herald Tribune:

If the Interstate Commerce Commission persists in refusing all fair demands of the railroads, it will have little difficulty in getting at a fair valuation of their properties. There will be nothing left for them to value.

New York, March, 3, 1931. Stephen D. Bayer.

Collecting Damages

Conductor: "Young man, you'll have to keep your head inside of the window."

Passenger: "I can look out if I want to."

Conductor: "All right; but if you break any of the iron work on the bridges, you'll pay for it."—Frisco Magazine.

Rail Coach Provides Mobile Life in Jail

The mobile age is asserting itself even in jail styles. A coach-jail has been placed in operation on the Louisville & Nashville. It has a capacity for 100 persons, whose egress is restrained by steel barred doors and windows. Its first duty as a portable jail was in transporting Federal prisoners from Frankfort, Ky., to the Atlanta Federal Penitentiary.

"Casey" Jones' Successor Retires

The man who completed "Casey" Jones' run after the accident which cost that song-famed engineman his life, has just been pensioned by the Illinois Central. He is Harry A. Norton of Memphis, engineer on the Mississippi division, who retires with a service record of nearly 40 years, the last 31 years of which were on the run "Casey" never finished.

This Begins to Sound Like a Fish Story

Employees of the Chicago, Rock Island & Pacific have started a turnip-raising contest among themselves, and are now claiming the railroad record for size in the raising of this succulent vegetable. Section Foreman Hedgepeth, of Dubach, La., is in the lead, with a 9¾ lb. entry, with Coach Cleaner Talley, of Booneville, Ark, a close second. Talley's entry weighs 9½ lb.

Red Caps Drilled

A little military discipline has been added to the schedule of the red caps, or ushers, who assist passengers at Central Station, Chicago. A monthly drill and inspection has been instituted, and the red caps are to be graded at each inspection according to their appearance, the four grades ranging from excellent to poor. Between 60 and 70 red caps compose the corps on duty at this station.

Narrow Escape

In an item recently published by the Albany Evening News, an account was given of a remarkable incident which occurred at Edwardsville, Pa. Helen Mayer, aged 13, while crossing the Delaware & Hudson tracks, fell in front of a train. The locomotive, train, and caboose passed over her, but when the train was stopped and the members of the crew went back, they found that Helen was already on her feet and she was able to walk home unassisted.

Commons Members Reject Rail Passes in Third Class

Although it was asserted recently by Philip Snowden, chancellor of the exchequer of England, that the members of the government should lead the way in economizing to meet the budgetary crisis, labor members of Parliament joined with the Conservatives and the Liberals recently in rejecting a suggestion that henceforth the railway passes issued to members of the Houses should be for third class instead of first class seats. The speeches made in the House of Commons left no doubt that a majority in all three parties objected to the proposed change. In fact, during the debate F. W. Pethick-Lawrence, financial secretary to the treasury, revealed that under the present voucher system members could have tickets in either class, but that none had ever been known to demand third class instead of first class tickets.

Island Railways

One would naturally suppose that the Japanese Government Railways, serving as they do the country that is generally known as the Island Empire, would operate on more islands than any other government railway. This, however, is not the case. The record in this regard goes to the Danish State Railways, which operate on nine islands as follows:—Ram, Alsen, Fuenen, Thisted, Hjorring, Zealand, Laaland, Falster and Bornholm. This compares with the Japanese Railways operation on the four islands of Yesso, Hondo, Shikoku and Kiushu. The Danish Railways also probably lead in the number of train ferriers operated, since, of course, the principal traffic movement is to the capital of Denmark, Copenhagen, which is on the Island of Zealand.

More Broadcasters

Seattle, Wash.

To the Editor:

I notice an item in the *Railway Age* telling about a dispatcher having a broadcasting station. This man does not own a broadcasting station, as is shown by his radio call letters of W4AID. This type of call letter is issued only to amateur radio stations who are not allowed to do any broadcasting of any kind for entertainment. They are only licensed for point to point communication with other amateurs, and must not carry on any communication for which they are to receive any pay. Amateur radio is just a hobby for those who are in it and we handle personal messages for people to all parts of the world. In case of a wire failure, such as a flood or sleet storm, the only means of communication from or to the country affected is by amateur radio. Two American railways have emergency communication systems for use in case of wires going down. This is made possible by the co-operation of the American Radio Relay League, which is the largest organization of amateur radio operators in the world. Regular tests are run so that the amateurs may become accustomed to the railroad method of handling railroad business. The roads which now have these nets are the Northern Pacific and the Pennsylvania.

As to railroad men being owners and operators of amateur radio stations, I should guess there are several hundred such in this country. There are five of us here in the Puget Sound country alone. K. W. Weingarten, machinist for the Milwaukee, at Tacoma shops, operates radio station W7BG at Tacoma and he is also a member of the board of directors of the American Radio Relay League representing the Northwestern division. Earl A. Harrington, owner and operator of amateur radio station W7AM, is a car inspector in the Seattle yard of the Northern Pacific. The two men following and myself are also employed by the Northern Pacific. W. B. Robinson, telegraph operator, Auburn, Wash., owns and operates amateur radio station W7HI at Auburn. George W. Selvidge, telegraph operator at Kent, Wash., owns and operates amateur radio station W7IH at Seattle. I own and operate amateur station W7AW in Seattle. I am a yard clerk in the Seattle yard and also operate the motor car which is used for inspection service on the western district of the Northern Pacific.

I. Vee Iversen.

NEWS

Pennsylvania Orders 100,900 Tons of Steel

Contracts amounting to $7,500,000 are divided among eight companies

The Pennsylvania has placed contracts for approximately $7,500,000 worth of structural steel and accessories. The material will be used in pushing forward the railroad's $175,000,000 improvement program, (reported in the *Railway Age* of February 21, page 422) including the electrification of its lines between New York and Washington, D. C., and terminal improvements at Newark, N. J., and Philadelphia, Pa. The structural steel contracts totaled more than 100,000 tons and were awarded to eight different companies as follows: American Bridge Company, 26,000 tons; Shoemaker Bridge Company, 14,000 tons; Ingalls Iron Works Company, 13,000 tons; Mt. Vernon Bridge Company, 4,300 tons; Fort Pitt Bridge Works, 4,000 tons; McClintic-Marshall Steel Corporation, 34,000 tons; Lehigh Structural Steel Company, 4,000 tons, and Phoenix Bridge Company, 1,600 tons.

Nearly one-half of the steel order will be used in speeding up the work of electrifying the Pennsylvania lines between New York and Washington. A total of 47,000 tons of fabricated steel is included for steel poles, cross-arms, beams and braces to carry the electric power lines for overhead signal bridges and for substations where switching equipment and electric power transformers are located. The work of erecting the necessary steel to carry the power lines between the Pennsylvania's Sunnyside yard on Long Island and Manhattan Transfer, N. J., has been practically completed. Work will go forward immediately on the sector between Manhattan Transfer and Trenton, N. J., where the railroad's present main line electrification begins. The electrified line now extends from Trenton as far as Wilmington, Del. At the same time, work will also get under way between Wilmington and Washington.

Construction to be undertaken immediately on the new passenger terminal at Philadelphia will require 18,000 tons of the steel order. Preliminary ground work on the Philadelphia station is already progressing rapidly, following the recent award of a $1,500,000 contract for excavation and foundation.

Steel for three new bridges over the Passaic river, approaching the site of the new Pennsylvania passenger station at Newark, as well as for the stations, platforms, viaducts and track bridges for additional track at that point, will total an additional 24,000 tons.

Fabrication of the steel will start immediately. Additional orders for signal power equipment and accessories for the electrical work between Manhattan Transfer, N. J., and Sunnyside yard, L. I., involving the expenditure of approximately $100,000, were also announced today.

"Heavy goods traffic moving on subsidized roads, with no responsibility for the upkeep of the roads, or for signaling, stations, etc., is unfair to the railways, to the public, and to the country. Shareholders themselves can help the railways in many ways, especially by remembering that every time they use a train for a journey, or for a load of goods, they are doing their little bit to help."

—From the annual report of the Southern Railway of Great Britain; Hon. Everard Baring, chairman.

L. & N. Freights Faster

The Louisville & Nashville, has made a general shortening of practically all of its fast freight train schedules, both northbound and southbound. The time between Cincinnati, Ohio, and New Orleans, La., has been reduced 13 hr. in both directions, while that between St. Louis and New Orleans was cut 9 hr. southbound and 19 hr. northbound, with corresponding reductions at intermediate points.

Club Meetings

The Railway Club of Pittsburgh (Pa.) will hold its next meeting on Thursday evening, April 23, at the Fort Pitt Hotel, Pittsburgh. Edwin F. Wendt, consulting engineer, Washington, D. C., will address the club on Federal Valuation of Railroads and Recapture of Excess Income.

The Car Foremen's Association of St. Louis will hold its next meeting on Tuesday evening, April 7, at the American Hotel Annex, St. Louis. The discussion will be on the Interchange Rules.

The Louisiana Car Department Association will hold its next meeting on Thursday evening, April 16, at the Monteleone Hotel, New Orleans, La. The discussion will be on the Interchange Rules.

Announcement of N. Y. Delivery Plan Expected

Studies reach point where early action on pending proposals is now anticipated

Studies in connection with proposals to establish collection and delivery service for carload freight in New York City have reached the point where it is expected that a definite plan to inaugurate such service will shortly be announced by the railroads serving that city. No details of the plan were forthcoming when this issue of the *Railway Age* went to press and thus it is not yet known whether or not the suggestion that the Railway Express Agency be utilized as a trucking medium to serve patrons of all carriers will be embodied in the plan.

The New York railroads have recently been urged to act more promptly on these collection and delivery proposals which have been under consideration for a year and a half. On September 21, 1930, the Shippers' Conference of Greater New York, the Merchants Association of New York, the Publishers Association of New York City and the Chamber of Commerce of the Borough of Queens joined in a letter to New York railway executives urging the installation of a co-ordinated trucking service. On November 6, 1930, the Chamber of Commerce of the State of New York adopted a resolution endorsing the principle of store-door collection and delivery of carload freight in New York City. More recently at a meeting of the Atlantic States Shippers' Advisory Board in Washington, D. C., on December 19, 1930, the railroads were criticized for inaction in the matter.

The present agitation for some form of direct collection and delivery of carload freight in New York City dates from August, 1929, when the Interstate Commerce Commission's decision in the "constructive and off track stations" case was issued. This decision permitted the carriers serving New York to cancel their "constructive" station tariffs and to limit the practice of trucking in lieu of lighterage to interchanges of freight between railroads or between railroads and steamship lines. But, while it found that abuses in the trucking plan existing at the time warranted the cancellation of the tariffs at issue, the commission nevertheless held that "The record is convincing that the carriers should make

every effort to avail themselves of truck transportation and co-ordination properly policed on Manhattan Island to the end that expensive pier stations may gradually be discontinued."

Following this decision New York shippers, who had opposed the abandonment of "constructive" station deliveries, commenced the agitation for some substitute trucking plan. The railroads accordingly appointed a committee to study the situation. This investigating body, headed by J. W. Roberts, assistant vice-president of the Pennsylvania, is a sub-committee of the presidents' conference committee of trunk line railway executives.

No substitute trucking service was installed, however, until the B. & O. on June 16 inaugurated its service for the handling by motor truck of carload unrestricted non-perishable freight. Under the plan, which was that road's attempt to meet the suggestions of the I. C. C., shipments were transferred at Staten Island from cars to trucks and moved through the station of the B. & O. at Pier 21, Manhattan, to the doorways of the receivers without unloading. The same service was available on freight outbound from Manhattan. The option of receiving or shipping freight through this service was given with the understanding that the shipper or consignee bore the cost of loading and unloading the merchandise in addition to the trucking costs between the carrier's station at Pier 21, East river, Manhattan, and the shipper's or consignee's place of business. If immediate delivery of goods was not desired the consignee might order that they be deposited at the pier station and was permitted to call for them with his own trucks at his convenience. Ten days after its inauguration the B. & O. service was suspended. In another few days it was permanently discontinued following conferences among executives of railways serving New York.

Meanwhile the presidents' conference committee received the report and recommendations of its sub-committee. Without being acted upon by the executives or made public these findings were turned over to the operating and traffic officers of the railroads involved. It is understood that these operating and traffic officers have now completed their survey of the report and recommendations and thus an early announcement of a definite plan is anticipated.

The proposal to employ the Railway Express Agency has undoubtedly been prompted by the desire to obviate any possibility of manipulated trucking charges which formed the basis of the principal argument against the former "constructive" station deliveries. Testimony at the Interstate Commerce Commission hearings in the "constructive and off-track stations" case revealed that rumors of manipulated trucking charges persisted all the while the former plan of direct delivery was in effect.

The only existing direct delivery service in New York City at present is that provided in Brooklyn by the South Brooklyn Railway Company, a subsidiary of the Brooklyn-Manhattan Transit Corporation. This service, operating under tariffs which became effective November 27, 1930, was described in detail in the Motor Transport Section of the *Railway Age* of December 27, 1930, page 1421.

Daniel Willard Honored

Daniel Willard, president of the Baltimore & Ohio, was the recipient at Philadelphia, on March 27, from the University of Pennsylvania, of the honorary degree of Doctor of Laws.

Southern Pacific Relief Fund

A total of 1,417 loans were made to employees from January 12, 1930, to February 28, 1931, under the employees' Relief Loan fund established by employees of the Southern Pacific in conjunction with the management, the road contributing an amount equal to that subscribed by the employees. During this period, contributions of officers and employees amounted to $43,867, making the total $87,734. A total of 4,270 borrowers and their dependents were aided by the loans.

American Employees of the C. N. R.

Questions in respect to the American employees on Canadian National have been placed on the order paper of the House of Commons at Ottawa by F. J. Lafleche, member of Parliament from Richmond, Que. Mr. Lafleche asks if American citizens are in the employ of the C. N. R. at Richmond, Que., and if so, their names, salaries and the names of those recommending them. Mr. Lafleche also wants to know whether these employees engage in political activities.

New Orleans Union Station Hearing

Railroads operating into New Orleans, La., have been notified by the Louisiana Public Service Commission that they must agree, not later than April 28, on a plan for the construction of a union passenger station in that city. At a hearing on March 24 Chairman Williams, of the state commission, declared that unless agreement on a plan is reached by April 28 the commission will issue an order compelling immediate construction in conformity with the plans of that body.

Grade Crossing Fatalities Reduced

Fatalities due to highway grade crossing accidents in 1930 were the lowest for any year since 1922, according to reports filed by the railroads with the Interstate Commerce Commission. A total of 2,020 persons lost their lives, a reduction of 465 or nearly 19 per cent compared with 1929. Persons injured totaled 5,517, a reduction of 1,287. This reduction took place in the face of an increase of approximately four per cent in all other fatalities on the highways.

Class I railroads in 1929 spent $28,445,680 for additional protection to or elimination of highway grade crossings. Of that amount, the railroads alone spent $25,113,338 for separation of grades, while the sum of $589,941 was expended for abandonment or removal of highway grade crossings, and $2,742,401 for additional automatic warning devices, gates, signals, etc.

Low-Price Pullman Car Excursions

The Boston & Maine, on Saturday, April 18, (April 19 being Patriots' Day) will run an excursion train from Boston to Montreal (329 miles) with the return scheduled for Monday night, in connection with which excursion tickets will be sold including the privilege of using the sleeping cars as "homes on wheels" during the stay in Montreal. The rates, including three nights' use of the sleeping cars, will be less than one-half the usual fare in sleeping cars. The train will have cars exclusively for women and others exclusively for men.

Erie to Move Executive Offices

Pending proposals for the removal of the executive offices of the Erie from New York to Cleveland, Ohio, in order to bring these offices nearer the geographical center of the railroad, were considered and approved at a recent meeting of the board of directors. The move, which will take place late in the summer, will include the traffic, operating, engineering, mechanical, claims and accounting departments, although an executive office and a complete traffic organization (both passenger and freight) will be maintained in New York.

Toronto Railway Club

The Toronto Railway Club has been organized at Toronto, Ontario, and already has enrolled 869 members. Meetings are to be held on the third Monday of each month, excepting June, July and August. The officers of the club are: President, T. C. Hudson, general superintendent, Canadian National; first vice-president, R. McKillop, superintendent, Canadian Pacific; second vice-president, H. T. Malcolmson, vice-president, Toronto, Hamilton & Buffalo; treasurer, G. H. Davis, assistant district engineer, Canadian Pacific; secretary, J. A. Murphy, assistant to the general superintendent of the Canadian National, Toronto.

C. N. R. Estimates in Parliament

Supplementary estimates for the Canadian National Railways for the fiscal year ending March 31, 1931, were tabled in the House of Commons last week by Premier R. B. Bennett. The total of these supplementary estimates is $13,694,008. Of this sum $11,410,400 is to be advanced to the railway for general railway purposes. There is also an amount of $434,210 to meet the deficit in the operation of the Canadian Government Merchant Marine during the calendar year 1930, and $122,730 to meet the operating deficit of the Canadian National West Indies steamship service in 1930. There is also an amount asked for of $1,726,666 to pay the railway for the operating deficit it incurred through carrying freight in accordance with the 20 per cent reduction provided for in

the Maritime Freight Rates Act. These estimates will be passed by the House with little discussion.

S. P. Dollar Day

The Southern Pacific, following the success of its "dollar day" held in February, when transportation at approximately one cent a mile was offered the public, has announced the same low round-trip rate on the system for April 3 and 4; round-trip tickets at three-fifths of the usual one-way fare; return not later than April 9.

Similar rates were placed in effect by the Atchison, Topeka & Sante Fe west of Albuquerque and by the Western Pacific, the Sacramento Northern and the Tidewater Southern.

Equipment Installed

Class I railroads in the first two months of 1931 placed 2,631 new freight cars in service, as reported by the American Railway Association. In the same period last year the total was 18,217. The new cars this year included 1,089 box cars, 1,418 coal cars, 81 flat cars and 42 refrigerator cars.

On March 1 there were 8,669 new freight cars on order compared with 31,239 on the same day last year. The railroads also placed in service in the first two months this year 26 new locomotives, compared with 113 in the same period in 1930; number on order on March 1 this year, 86, compared with 450 on the same day last year.

Milwaukee and Rock Island Complete New Joint Line

The Chicago, Milwaukee, St. Paul & Pacific and the Chicago, Rock Island & Pacific on April 1 completed the construction of a new double track line between Polo, Mo., and Birmingham, 58 miles, providing the Milwaukee with a low grade entrance into Kansas City from the north over its old route, and the Rock Island with a new entrance into that city. Including the construction by the Rock Island of a 37-mile single track line from its present line at Coburn, Mo., to Polo, at a cost of about $6,000,000, the total cost of the project was about $12,000,000. It is expected that the new lines will be placed in operation during May.

Plaintiff Violates Railroad Damage Suit Injunction

Because she filed a damage suit in the United States circuit court at St. Louis, asking $95,000 damages from the Louisville & Nashville under the Federal Employers' Liability Act for the death of her husband, a locomotive engineman who was killed in a boiler explosion at Kinney, Tenn., Mrs. Inez B. Crandall has been held in contempt by Probate Judge Travis B. Williams of Evansville, Ind., and fined $500 and costs. In August, 1930, Judge Williams issued an injunction, upon petition of the railroad, to restrain Mrs. Crandall from filing suit against the railroad in any court except the one having jurisdiction over Kinney, that being the one at Evansville. Judge Williams, in ordering Mrs. Crandall imprisoned for three months offered to suspend her sentence if she would dismiss the suit filed at St. Louis; but this she refused to do. When taken before Judge Evan A. Evans of the United States circuit court of appeals at Chicago on a writ of habeas corpus Mrs. Crandall was released on her own recognizance, pending a decision by that court.

Milwaukee Combines Two Trains Between Chicago and Savanna

The Chicago, Milwaukee, St. Paul & Pacific, beginning March 29, is operating its Chicago-Kansas City passenger train, the Southwest Limited, and its Chicago-Omaha passenger train, the Arrow, as one train between Chicago and Savanna, Ill. The combined train now leaves Chicago at 6:20 p.m. Returning, the trains are combined at Savanna and are operated as one train, leaving at 5 a.m. and arriving in Chicago at 8:15 a.m. To make this change possible, the Southwest Limited is being run through Savanna and Clinton instead of via Moline and Rock Island.

Traffic Club of Chicago

At the annual election of officers of the Traffic Club of Chicago on March 31, the following officers were elected for the ensuing year: President, J. H. Mangold, general freight agent of the Elgin, Joliet & Eastern; first vice-president, H. A. Palmer, editor and manager of the Traffic World; second vice-president, W. D. Beck, district manager of the Car Service Division of the American Railway Association; third vice-president, R. J. Wallace, traffic manager of the Jacques Manufacturing Company; secretary, R. W. Campbell, manager of the traffic department of the Butler Paper Corporation, and treasurer, J. H. Howard, manager of the Western Weighing and Inspection bureau.

Great Lakes Advisory Board

The Great Lakes Regional Shippers' Advisory Board met at Cleveland, Ohio, on March 25. The commodity reports indicate as a whole a slight decrease in the volume of carload traffic during the ensuing quarter as compared with the second quarter of 1930, though business is now slowly rising above the level of the last three months. In numerous important commodities, the present reports indicate little or no change; flour and mill products, coal and coke, gravel and stone, petroleum, iron and steel, lime and plaster and paper and prepared roofing. The only important increase predicted is in grain, six per cent. The important decreases expected are: Hay, 11 per cent; potatoes, 52 per cent; live stock, 10; ore and concentrates, 24; lumber and forest products, 17; machinery, 24; brick and clay, 16; agricultural implements, 25, and automobiles 20 per cent.

The president elected for the ensuing year is J. M. Montigney, Cleveland Tractor Company, Cleveland, Ohio.

The meeting was addressed by John M. Fitzgerald, representing the Eastern Railroad Presidents' Conference and Larue Brown for the National Automobile Chamber of Commerce, who spoke pro and con concerning highway transportation as affecting the railroads.

Decrease in Carloading Estimated for Second Quarter

Shippers of the country, through estimates submitted to the several shippers' regional advisory boards, anticipate that carload shipments of the 29 principal commodities in the second quarter of 1931, will be approximately 7,029,231 cars, a reduction of 430,805 cars or 5.8 per cent below the movement in the corresponding period of 1930.

Except for the Pacific Coast board, and the Ohio Valley board, all of the 13 regional boards, anticipate reductions. The estimate and the percentage of increase or decrease are as follows (total cars):

	Actual 1930	Estimated 1931	Per cent
Atlantic States	801,131	755,103	5.7 Decrease
Central Western	244,647	243,728	0.4 Decrease
Pacific Coast..	291,509	305,863	4.9 Increase
Pacific N. W..	268,732	240,440	10.5 Decrease
Great Lakes..	591,845	525,512	11.2 Decrease
Ohio Valley..	786,545	805,637	2.4 Increase
Mid-West	1,136,920	1,036,110	8.9 Decrease
Northwest	459,816	407,855	11.3 Decrease
Trans-Mo.-Kansas	421,444	386,823	8.2 Decrease
Southeast	829,856	781,573	5.8 Decrease
Southwest	522,939	508,546	2.8 Decrease
New England.	162,365	154,215	5.0 Decrease
Allegheny	942,287	877,826	6.8 Decrease
TOTAL ...	7,460,036	7,029,231	5.8 Decrease

It is estimated that of the 29 commodities, increases in transportation requirements will develop for four as follows: citrus fruits; fresh vegetables, except potatoes; Petroleum and petroleum products, and Chemicals and explosives.

Illinois Central Industrial Survey

The Illinois Central has recently completed regional studies covering industrial conditions in the 14 states through which the company's lines pass, from the Great Lakes to the Gulf of Mexico. This survey required 15 months of field work and was made by Pace, Inc., Chicago, under the supervision of Mark Fenton, general industrial agent of the railroad. Information on industrial opportunities, including data on raw materials, fuel, water, power, gas, buying power and other matters of industrial significance, were collected and have been mapped and tabulated in convenient form in seven volumes. The survey will be used in assisting manufacturers who are considering the establishment of new industries or branch plants.

Six Months Guaranty Payments Held to Be Taxable Income

The United States Board of Tax Appeals, in a decision rendered on March 30 on an appeal taken by the Kansas City Southern and affiliated companies from a decision of the commissioner of internal revenue, has held that $962,453 of payments to the companies in the system by the federal government under the six-months guaranty provided for by the transportation act in 1920 "were elements of the petitioner's operating receipts in 1920, resulting from the use of its capital in that year, and, therefore, within the standard definition of taxable

income." According to the decision the petitioner had contended that the payment was in the nature of a subsidy or gift and that there was no legal basis for its inclusion in taxable income in 1920 or any other year. A similar decision had been rendered by the board in previous cases brought by the Missouri Pacific and Gulf, Mobile & Northern. The board holds that the guaranty payment was received free from limitations or restrictions and that from the date of such receipt it was available for all corporate purposes to which income may be applied. It also said that it was "in recognition of an obligation assumed by the government when it temporarily sequestered petitioner's railroad for war purposes." The decision also covered a large number of other items involved in the accounting between the company and the Railroad Administration.

Santa Fe Transportation Company Sold to Hunter Clarkson

The Santa Fe Transportation Company, operated in connection with the Harvey Company and the Atchison, Topeka & Santa Fe to provide motor coach tours in the vicinity of Santa Fe, N. M., and Winslow, Ariz., has been acquired by Hunter Clarkson, Inc., with headquarters at Santa Fe. R. H. Clarkson, who has acquired the company as Hunter Clarkson, Inc., was general manager of the Santa Fe Transportation Company. He has announced that the purchase was made in order to extend the operations of the Indian detours and allied services. New rates which became effective on April 1 for tours from Santa Fe, include a three-day tour for $55, a two-day tour for $35 and a one-day tour for $15, representing a reduction in rates in the first two cases.

The C. N. R. in February

Gross revenues of the Canadian National Railways, excluding eastern lines, during February 1931 were $13,414,063, a decrease of $3,622,311, as compared with February 1930. Operating expenses in February 1931 were $13,584,611, a decrease of $2,077,903, as compared with the corresponding month of 1930. There was an operating deficit of $170,548 for February, 1931.

For the two months period from January 1, 1931, gross revenues were $27,170,938, a decrease of $7,286,608, as compared with the two months of 1930. Operating expenses for the first two months of 1931 were $27,853,415, a decrease of $4,411,662, as compared with the similar period of 1930. For the two months there was an operating deficit of $682,477.

Progress Reported on Four-System Plan

Counsel for the Baltimore & Ohio, the Chesapeake & Ohio, the New York Central and the Pennsylvania are still working on the details of the petition they expect to present soon to the Interstate Commerce Commission for such modification of its consolidation plan as may be required to pave the way for consideration of the plan for grouping the eastern railroads into four great systems. No definite predictions are available, however, as to how much time will yet be required before the petition can be filed.

One step toward the adjustment of one of the important unsettled features of the plan has been taken, it was learned following a meeting of counsel in Washington on March 25, by the appointment of George T. Slade, formerly vice-president of the Northern Pacific and now a director of several railroads, as arbitrator of the question as to the right to the use by the Pennsylvania of trackage over the Nickel Plate between Ashtabula, Ohio, and Brocton, N. Y.

Other points still unsettled involve the price to be paid by the Chesapeake & Ohio-Nickel Plate group for stock of the Lehigh Valley, held by Pennsylvania interests; and the disposition of the Virginian. Executives of the four systems held a conference in New York on March 26 with representatives of the railway labor organizations in an effort to reach some understanding as to principles for the protection of the interests of the employees as they may be affected by unifications.

Low Rates and Subvention for Limestone Fertilizer

As the result of a movement to encourage the greater use of lime in agriculture, particularly in those sections where soil corrective is required to stimulate more economical production of farm crops, Ontario farmers will enjoy a great reduction in the transportation cost of pulverized limestone, it was announced in Toronto by Hon. T. L. Kennedy, Ontario Minister of Agriculture.

The Canadian National and Canadian Pacific railways have agreed to reduce the present tariff on the pulverized limestone to be used by farmers to the amount of 25 per cent, and the provincial and Dominion departments of agriculture, in co-operation, will grant further subventions to the combined amount of one-half the remaining freight rate with a maximum of $1 per ton. On limestone screenings, which now enjoy special freight rates, the two governments will grant subventions amounting to one-half the freight rate with a maximum of $1 per ton, Hon. Mr. Kennedy said. In order to take advantage of this assistance purchasers must order at least a minimum carload of thirty tons.

The C. P. R. in February

Operating net of the Canadian Pacific for February amounted to $513,690, as compared with $912,635 in February of last year, a decrease of $398,945. Gross earnings at $10,553,181 for February showed a decrease of $1,806,719, while operating expenses for the month under review amounted to $10,039,490, a decrease of $1,407,773.

For the first two months of this year, operating net of the road amounted to $1,377,698, as compared with $1,701,465 in the corresponding two-month period of last year, a decrease of $323,766. Gross earnings for the two months totalled $21,972,063, a decrease of $3,406,334 from the total for the corresponding two-month period of last year, while operating expenses at $20,594,364 showed a decrease of $3,082,568.

The following table shows gross earnings, expenses and net of the company for the month of February and for the first two months of the year:

	FEBRUARY		
	1931	1930	Decr.
	$	$	$
Gross	10,553,181	12,359,900	1,806,719
Exp.	10,039,490	11,447,264	1,407,773
Net	513,690	912,635	398,945
	TWO MONTHS		
	1931	1930	Decr.
	$	$	$
Gross	21,972,063	25,378,398	3,406,334
Exp.	20,594,364	23,676,932	3,082,568
Net	1,377,698	1,701,465	323,766

Reduction in Sugar Rates Opposed

Efforts of the western transcontinental railways to meet the competition of the Panama canal route and the federal barge line on the Mississippi river for the handling of California sugar by a reduction in the rail rates from California have been opposed in briefs filed with the commission by counsel for the eastern roads as well as by the Inland Waterways Corporation. The transcontinental lines had filed a fourth section application proposing a reduction from 84 to 65 cents in the rate on sugar from California to St. Louis, Chicago, Milwaukee and other points east of the Missouri river, without making corresponding reductions to intermediate points.

Among other points the brief of the eastern lines says that this would contravene provisions of the Inland Waterways Corporation act, designed to protect the government line; and that it would "not only extinguish legitimate competition by water" but would do so by placing an undue burden on the applicants' other traffic.

The barge line in its brief says that the granting of the application may divert California sugar from the present water route via the Panama canal to New Orleans and thence via the barge line, or it may supplant sugar now moving from New Orleans and nearby producing points with California sugar. It also points out that its revenue from California sugar for the past three years has greatly exceeded its net income for that period. In 1929 and for eleven months of 1930 it had a deficit.

The brief filed on behalf of the applicants says "it is indefensible than an agency of the United States engaged in the transportation business at a loss in competition with its own private citizens should nevertheless oppose the right of these applicants to compete with such agency by the establishment of rates which will produce cost and a substantial profit besides." The brief says that the rates proposed will enable the all-rail lines to regain some of the sugar traffic from California and that the value of the relief asked has been computed

at not less than $696,000 a year in net revenue to the carriers. In the past five years, it is stated, over 128,000 tons of midwestern sugar has been diverted from rail lines to water routes, including 50,000 tons in 1930, the net cost of shipping California sugar via New York, the Erie canal and the Great Lakes being 59 cents and that via the Panama canal to New Orleans and thence by the federal barge line to St. Louis being 67.5 cents less 2.66 cents storage charges. One feature of the application is the proposal that the commission's order enable the applicants to reduce the terminal rates to a minimum of 48 cents without further application if the water rates should be further reduced. It is asserted that the financial condition of the Southern Pacific, one of the principal applicants, is such that it cannot afford to stand idly by and permit its sugar traffic to be lost; that in the last decade that company earned 24.6 per cent less return on its capital investment than in the ten years prior to federal control, 4.03 per cent as compared with 5.02 per cent, and that since 1923 it has added to its capital investment $301,000,000 on which it has been unable to earn any return whatever.

Atterbury Addresses Atlantic States Shippers Board

Pointing out that "The monopoly cry against railroads as a pretext for barring them from their natural destiny as general transportation agencies has no sound basis," General W. W. Atterbury, president of the Pennsylvania, and principal speaker at the regular meeting of the Atlantic States Shippers Advisory Board held in New York on March 27, discussed the conditions leading up to the promulgation by the railway executives, last fall, of a "declaration of policy," and stressed the benefits to the public of allowing railways to engage in all forms of transportation. "The advantages of co-ordinated transport," he said, "are so great that its appeal to shippers and the general public must prove irresistable. Laws and practices which bar the railroads from bringing it to full fruition must inevitably yield to economic needs. With confidence in this outcome and in the continued growth and industrialization of the country, I consider the railroads' future, as general transportation agencies providing any form of service which any shipper or passenger desires, to be amply assured. The years to come will give them more, not less, to do than in the past."

The reports of the board's commodity committees indicate, for the next three months that the volume of carload freight will be about 5.7 per cent less than the movement in the second quarter of 1930. This summarized percentage results from large increases and large decreases. In fruits and fresh vegetables, there is an expected increase of 20 per cent and in grain one of 4.6 per cent. In coal and coke, which constitute more than one-third of the whole volume of carload freight in this record, the committee expects a decrease of 4.3 per cent. Other decreases are: Potatoes, 25 per cent; ore, etc., 20 per cent; lumber, etc., 11; iron and steel, 15; machinery, 19; cement, 20; brick, etc., 10, and lime and plaster, 15 per cent.

Meetings & Conventions

The following list gives names of secretaries, date of next or regular meetings and places of meetings.

AIR BRAKE ASSOCIATION.—T. L. Burton, Room 5605, Grand Central Terminal Building, New York City. Exhibit by Air Brake Appliance Association.

AIR BRAKE APPLIANCE ASSOCIATION.—Fred W. Venton, Crane Company, 836 So. Michigan Blvd., Chicago. Meets with Air Brake Association.

AMERICAN ASSOCIATION OF FREIGHT TRAFFIC OFFICERS.—W. R. Curtis, F. T. R., M & O. R. R., Chicago, Ill.

AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS.—E. L. Duncan, 332 S. Michigan Ave., Chicago. Next convention, June 16-18, 1931, West Baden Springs Hotel, West Baden, Ind.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J. 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—A. G. Peck, Acting Secretary, 811 W. 35th Street, Kansas City, Mo. Next meeting June 9-13, 1931, Jefferson Hotel, St. Louis, Mo.

AMERICAN ASSOCIATION OF SUPERINTENDENTS OF DINING CARS.—F. R. Borger, C. I. & L. R. R., 836 Federal St., Chicago. Next convention, October 20-22, 1931, Baltimore, Md.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—Guy C. Hecker, 292 Madison Ave., New York. Next convention, September 26-October 2, 1931. Atlantic City, N. J.

AMERICAN RAILWAY ASSOCIATION.—H. J. Forster, 30 Vesey St., New York, N. Y.
- Division I.—Operating.—J. C. Caviston, 30 Vesey St., New York, N. Y.
- Freight Station Section. — R. O. Wells, Freight Agent, Illinois Central Railroad, Chicago.
- Medical and Surgical Section.—J. C. Caviston, 30 Vesey St., New York. Next convention June 8-9, 1931, Pennsylvania Hotel, New York, N. Y.
- Protective Section.—J. C. Caviston, 30 Vesey St., New York. Next convention June 23-25, 1931, Stevens Hotel, Chicago, Ill.
- Safety Section.—J. C. Caviston, 30 Vesey St., New York.
- Telegraph and Telephone Section.—W. A. Fairbanks, 30 Vesey St., New York
- Division II.—Transportation.—G. W. Covert, 59 East Van Buren St., Chicago.
- Division III.—Traffic.—J. Gottschalk, 143 Liberty St., New York.
- Division IV—Engineering.—E. H. Fritch, 59 East Van Buren St., Chicago. Next meeting, March 15-17, 1932, Palmer House, Chicago. Exhibit by National Railway Appliances Association.
- Construction and Maintenance Section.—E. H. Fritch. Next meeting, March 15-17, 1932, Palmer House, Chicago.
- Electrical Section—E. H. Fritch.
- Signal Section.—R. H. C. Balliet, 30 Vesey St., New York. Annual meeting May 12-13, 1931, Roosevelt Hotel, New York City.
- Division V.—Mechanical.—V. R. Hawthorne, 59 East Van Buren St., Chicago. Next meeting, June 23-25, 1931, Congress Hotel, Chicago.
- Equipment Painting Section.—V. R. Hawthorne, 59 East Van Buren St., Chicago.
- Division VI.—Purchases and Stores.— W. J. Farrell, 30 Vesey St., New York, N. Y. Next meeting, May 19-21, 1931, Biltmore Hotel, Atlanta, Ga.
- Division VII.—Freight Claims.—Lewis Pilcher, 59 East Van Buren St., Chicago.
- Division VIII.—Motor Transport.—George M. Campbell, 30 Vesey St., New York, N. Y.
- Car Service Division.—C. A. Buch, 17th and H. Sts., N. W., Washington, D. C.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W. Ry., 319 N. Waller Ave., Chicago. Next convention, October 20-22, 1931, Royal York Hotel, Toronto, Ont. Exhibit by Bridge and Building Supply Men's Association.

AMERICAN RAILWAY DEVELOPMENT ASSOCIATION.—A. W. Large, Gen. Agri. Agt., C. R. I. & P. Ry., Chicago, Ill. Annual meeting, June 17-19, 1931, Hotel Benjamin Franklin, Philadelphia, Pa.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—Works in co-operation with the American Railway Association, Division IV.—E. H. Fritch, 59 East Van Buren St., Chicago. Next meeting, March 15-17, 1932, Palmer House, Chicago. Exhibit by National Railway Appliances Association.

AMERICAN RAILWAY MAGAZINE EDITORS ASSOCIATION.—Miss E. Phillips, N. Y., N. H. & H. Magazine, Boston, Mass. Next meeting, June 4, 1931, Philadelphia, Pa.; June 5, 1931, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—G. G. Macina, C., M., St. P. & P. R. R., 11402 Calumet Ave., Chicago. Exhibit by Supply Association of the American Railway Tool Foremen's Association.—E. E. Caswell, Union Twist Drill Co., 11 S. Clinton St., Chicago.

AMERICAN SHORT LINE RAILROAD ASSOCIATION.—R. E. Schindler, Secretary, Union Trust Bldg., Washington, D. C.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Railroad Division, Paul D. Mallay, Johns-Manville Corp., 292 Madison Ave., New York.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—H. L. Dawson, 1104 Chandler Building, Washington, D. C. Next meeting, January 26-28, 1932, Hotel Jefferson, St. Louis, Mo.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—H. D. Morris, District Claim Agent, Northern Pacific Ry., St. Paul, Minn. Annual convention, June 17-19, 1931, Royal York Hotel, Toronto, Ont.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Station, Chicago. Exhibit by Railway Electrical Supply Manufacturers' Association.

ASSOCIATION OF RAILWAY EXECUTIVES.—Stanley J. Strong, Transportation Building, Washington, D. C.

ASSOCIATION OF RAILWAY SUPPLY MEN.—J. F. Gettrust, Ashton Valve Company, 565 Washington Blvd., Chicago. Meets with International Railway General Foremen's Association.

BOILERMAKERS' SUPPLY MEN'S ASSOCIATION.—Frank C. Hasse, Oxweld R. R. Service Company, 230 N. Michigan Ave., Chicago. Meets with Master Boiler Makers' Association.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—S. A. Baber, High Grade Manufacturing Co., 10418 St. Clair Ave., Cleveland, Ohio. Meets with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—C. R. Crook, 2276 Wilson Ave., N. D. G., Montreal, Que. Regular meetings, 2nd Monday in each month, except June, July and August, Windsor Hotel, Montreal, Que.

CAR DEPARTMENT OFFICERS' ASSOCIATION.—A. S. Sternberg, M. C. B. Belt Ry. of Chicago, 7926 South Morgan Street, Chicago. Exhibit by Supply Men's Association.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—G. K. Oliver, 2514 W. 55th St., Chicago. Regular meetings, 2nd Monday in month, except June, July, and August, Great Northern Hotel, Chicago.

CAR FOREMEN'S ASSOCIATION OF LOS ANGELES.—J. W. Krause, Room 299, 610 So. Main St., Los Angeles, Cal. Regular meetings, second Monday of each month, except July, August and September, Room 299, 610 So. Main St., Los Angeles.

CAR FOREMEN'S ASSOCIATION OF ST. LOUIS, MO.—F G. Wiegman, 720 N. 23rd St., East St. Louis, Ill. Meetings first Tuesday of each month, except July and August, American Hotel Annex, 6th and Market Sts., St. Louis, Mo.

CENTRAL RAILWAY CLUB OF BUFFALO.—T. J. O'Donnell, 1817 Hotel Statler, McKinley Square, Buffalo, N. Y. Regular meetings, 2nd Thursday each month, except June, July, August, Hotel Statler, Buffalo, N. Y.

CINCINNATI RAILWAY CLUB.—D. R. Boyd, 453 E. 6th St., Cincinnati, Ohio. Meetings 2nd Tuesday in February, May, September and November.

CLEVELAND RAILWAY CLUB.—F. L. Frericks, 14416 Alder Ave., Cleveland, Ohio. Meetings, second Monday each month, except July, August, September, Auditorium, Brotherhood of Railroad Trainmen's Building, West 9th St., and Superior Ave., Cleveland.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—W. J. Mayer, Michigan Central R. R., Detroit, Mich. Exhibit of International Railroad Master Blacksmiths' Supply Men's Association.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' SUPPLY MEN'S ASSOCIATION.—W. A. Rockenfield, National Machinery Company, Tiffin, Ohio. Meets with International Railroad Master Blacksmiths' Association.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—C. T. Winkless, Room 700 La Salle Street Station, Chicago. Exhibit by International Railway Supply Men's Association.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1061 W. Wabasha St., Winona, Minn.

INTERNATIONAL RAILWAY SUPPLY MEN'S ASSOCIATION.—C. M. Huffman, Dearborn Chemical Co., 310 So. Michigan Ave., Chicago. Meets with International Railway Fuel Association.

MASTER BOILER MAKERS ASSOCIATION—A. F. Stiglmeier, 29 Parkwood St., Albany, N. Y.

Exhibit by Boiler Makers' Supply Men's Association.

MASTER CAR BUILDERS' AND SUPERVISORS' ASSOCIATION.—(See Car Department Officers' Association.)

NATIONAL ASSOCIATION OF RAILROAD AND UTILITIES COMMISSIONERS.—James B. Walker, 270 Madison Ave., New York. Annual convention, 1931, Richmond, Va.

NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.—Roy. M. Edmonds, 1252 Syndicate Trust Bldg., St. Louis, Mo. Annual convention, May 5-7, 1931, West Baden Springs Hotel, West Baden, Ind.

NATIONAL ASSOCIATION OF RAILROAD TIE PRODUCERS.—Roy. M. Edmonds, 1252 Syndicate Trust Bldg., St. Louis, Mo. Annual convention, May 5-7, 1931, West Baden Springs Hotel, West Baden, Ind.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 1014 South Michigan Ave., Chicago. Exhibit at A. R. E. A. convention.

NATIONAL SAFETY COUNCIL. — Steam Railroad Section: J. L. Walsh, Supt. Safety, M.-K.-T. R. R., Dallas, Tex. Annual congress, October 12-16, 1931, Hotel Stevens, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2nd Tuesday in month, excepting June, July, August and September, Copley Plaza Hotel, Boston, Mass.

NEW YORK RAILROAD CLUB.—D. I. McKay, 26 Cortlandt St., New York. Regular meetings, 3rd Friday in month, except June, July and August, 29 W. 39th St., New York City.

PACIFIC RAILWAY CLUB.—W. S. Wollner, P. O. Box 3275, San Francisco, Cal. Regular meetings 2nd Thursday in month, alternately in San Francisco and Oakland.

RAILWAY ACCOUNTING OFFICERS' ASSOCIATION.—E. R. Woodson, 1124 Woodward Building. Washington, D. C. Next convention, June 23-26, 1931, Palmer House, Chicago.

RAILWAY BUSINESS ASSOCIATION. — Frank W Noxon, 1112 Shoreham Building, Washington, D. C.

RAILWAY CLUB OF PITTSBURGH.—J. D. Conway, 1841 Oliver Building, Pittsburgh, Pa. Regular meeting, 4th Thursday in each month, except June, July and August, Fort Pitt Hotel, Pittsburgh, Pa.

RAILWAY ELECTRICAL SUPPLY MANUFACTURERS' ASSOCIATION.—Edward Wray, 9 S. Clinton St., Chicago. Meets with Association of Railway Electrical Engineers.

RAILWAY EQUIPMENT MANUFACTURERS' ASSOCIATION.—F. W. Venton, Crane Co., 836 S. Michigan Ave., Chicago. Meets with Traveling Engineers' Association.

RAILWAY FIRE PROTECTION ASSOCIATION.—R. R. Hackett, Baltimore & Ohio R. R., Baltimore, Md.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 1841 Oliver Bldg., Pittsburgh, Pa. Meets with Mechanical Division, Purchases and Stores Division and Motor Transport Division, American Railway Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 30 Church St., New York. Meets with Telegraph and Telephone Section of A. R. A. Division 1.

RAILWAY TREASURY OFFICERS' ASSOCIATION.—L. W. Cox, 1217 Commercial Trust Bldg., Philadelphia, Pa.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION. — T. F. Donahoe, Gen. Supvr. Road, Baltimore & Ohio, Pittsburgh, Pa. Next convention, September 22-24, 1931, Hotel Stevens, Chicago. Exhibit by Track Supply Association.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Drawer 24, M. P. O., St. Louis, Mo. Regular meetings, 2nd Friday in month, except June, July and August.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, West Nyack (Rockland Co.), N. Y. Meets with A. R. A. Signal Section.

SOUTHERN AND SOUTHWESTERN RAILWAY CLUB.—A. T. Miller, P. O. Box 1205, Atlanta, Ga. Regular meetings, 3rd Thursday in January, March, May, July, September and November. Ansley Hotel, Atlanta.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—R. G. Parks, A. B. & C. Ry., Atlanta, Ga.

SUPPLY MEN'S ASSOCIATION.—E. H. Hancock, Treasurer, Louisville Varnish Co., Louisville, Ky. Meets with A. R. A. Div. V. Equipment Painting Section.

SUPPLY MEN'S ASSOCIATION.—Bradley S. Johnson. W. H. Miner, Inc., 667 The Rookery Building, Chicago. Meets with Car Department Officers' Association.

TORONTO RAILWAY CLUB.—J. A. Murphy, Asst. to Gen. Supt., C. N. R., Toronto. Regular meetings 3rd Monday of each month, except June, July and August.

TRACK SUPPLY ASSOCIATION.—L. C. Ryan, Oxweld Railroad Service Co., Carbon & Carbide Building, Chicago. Meets with Roadmasters' and Maintenance of Way Association.

TRAVELING ENGINEERS' ASSOCIATION. — W. O. Thompson, 1177 East 98th St., Cleveland, O. Exhibit by Railway Equipment Manufacturers' Association.

WESTERN RAILWAY CLUB.—W. J. Dickinson, 343 So. Dearborn St., Chicago. Regular meetings 3rd Monday each month, except June, July and August.

Foreign

Albert Bellamy, British Railway Labor Leader, Dies

Albert Bellamy, labor member of the British Parliament since 1928, and a well-known British railway labor leader, died in London on March 26, at the age of 60, according to a despatch to the New York Times. Originally a locomotive engineman, Mr. Bellamy became a leader in employees' organizations, serving as president of the Amalgamated Society of Railway Servants from 1911 to 1913, and as first president of the National Union of Railwaymen from its inception in 1913 to 1917.

Large Deficit on Commonwealth Railways of Australia

The Commonwealth Railways of Australia, reporting a deficit equivalent to $3,330,300 after interest and sinking fund charges, experienced during the year ending June 30, 1930, their poorest fiscal period of the past decade. The result compares with a 1928-29 deficit of $1,917,500; the increase of $1,412,700 is due to the 1929-30 operating loss of $732,700 as against 1928-29 net revenues of $26,500 and the increases of $606,300 and of $46,300 respectively in interest charges and the sinking fund deduction.

Comparative statistics of operating and financial results during the past two years are as follows:

	1929-30	1928-29
Miles of line	2,145	1,970
Investment in road and equipment	$74,853,700	$68,833,600
Gross revenues	1,968,100	2,772,100
Operating expenses	2,700,800	2,745,700
Net revenues from operations	732,700*	26,500
Interest charges	2,347,200	1,739,900
Sinking fund	250,400	204,100
Deficit	3,330,300	1,917,500

* Operating loss.

As the above table reveals, the 1929-30 operating ratio of these government lines passed the 100 per cent mark; it stood at 137.23 per cent after being under 100 in the three immediately prior years, the only three years in which any net operating revenues have been reported since 1910-11.

Four railways comprise the Commonwealth lines as follows: The Trans-Australian, 1,052 miles; the Central Australia, 771 miles; the North Australia, 317 miles, the Federal Territory, 5 miles. The Central Australia was extended 123 miles and the North Australia 52 miles during the year; the extensions account in the main for the increased interest and sinking fund charges. Also the completion of these projects has served to reduce the traffic on the railways involved. "In comparing the results on the Central Australia and North Australia railways with the results of the past few years," the report says "it has to be borne in mind that during those years a very large quantity of railway construction material was carried and, in addition, there was a consequential increase in the passenger and merchandise traffic in the catering for numbers of people following the railways construction camps. All this traffic practically ceased very early in the year under review."

The decline in traffic as compared with the previous year is also attributed "to trade depression generally, to aerial and other competition on the Trans-Australian Railway, and to very serious washaways causing traffic to be suspended on each of the Trans-Australian, Central Australia and North Australia railways."

In the face of the foregoing declines in revenue the management was unable to effect any comparable decrease in operating expenses although there was a decline of $45,000 from the 1928-29 expense figure. The following reasons are given in the report for the failure to curtail operating expenses more drastically: (a) Heavy repairs and replacement costs owing to washaways; (b) the extension of the Central Australia and the North Australia into territory bringing very little revenue, the added mileage causing considerable increases in maintenance costs; (c) having to maintain the already very limited train services on each of the three railways nothwithstanding the depression in trade; (d) having to pay increased wages on account of award conditions.

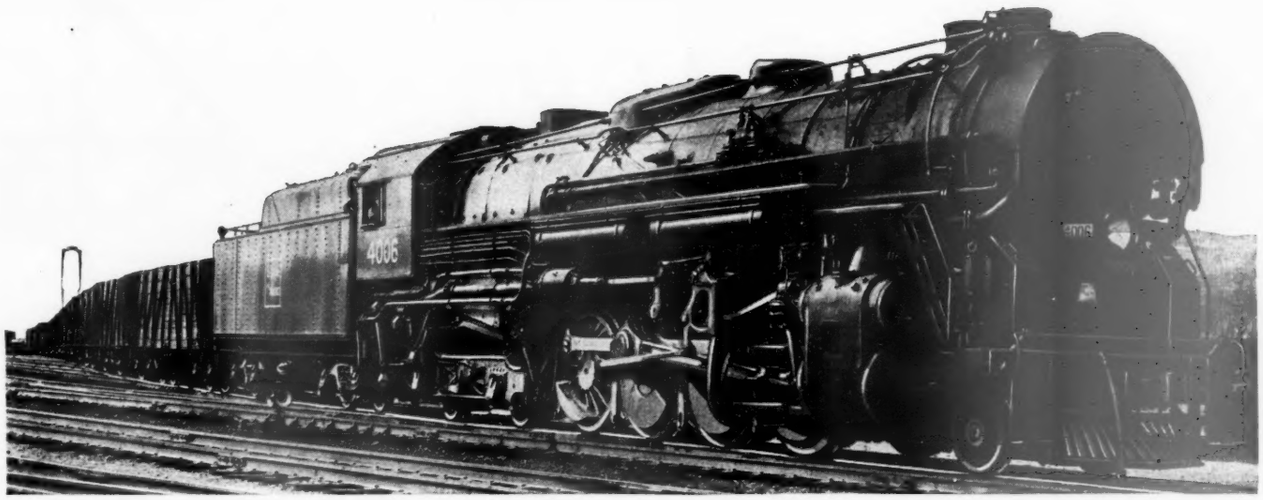
Orleans Railway to Extend Electrification

The Orleans Railway of France has adopted plans for the electrification of its Paris-Nantes line from Les Aubrais, near Orleans, to Tours, about 75 miles, according to the Railway Gazette (London). The program, which is to be completed in 1933, is divided into three principal parts, as follows: (1) Erection of a 90,000-volt power distribution line from Chaingy (Loiret) to St. Pierre-des-Corps, near Tours; (2) construction of five substations, 90,000-1,500 volts, and (3) erection of 1,500-volt trolley wires. It will also be necessary to raise several bridges, particularly the Pont Bannier at Orleans. Power for the new section will be taken from the 220,000-90,000-volt station at Chaingy.

Electrification of the Orleans system, which has already been carried out between Paris and Vierzon, was to have been continued in the direction of Chateauroux and Brive, where the work of raising bridges and removing telephone wires has already been completed. But the company has decided, the Gazette report continues, to postpone this scheme and to proceed with the Orleans-Tours electrification, as this will allow more efficient use of locomotives.

One of the most important results of the new electrification will be an improvement in running time, particularly of the company's two famous expresses to the Spanish frontier, the Sud Express and the Pyrenees-Cote-d'Argent, which will no longer be required to stop at Les Augrais to change power. Upon completion of the work, this change will be effected at St. Pierre-des-Corps. Orleans-Tours locals will also be considerably speeded up.

Continued on Second Left Hand Page



SUPER-POWER

Cuts Operating Costs

▶▶▶▶▶▶▶▶ "The revolution in railroad transportation which has speeded up the movement of freight and greatly increased railroad earnings in the last six years is due in no small part to the increased efficiency of the locomotive."

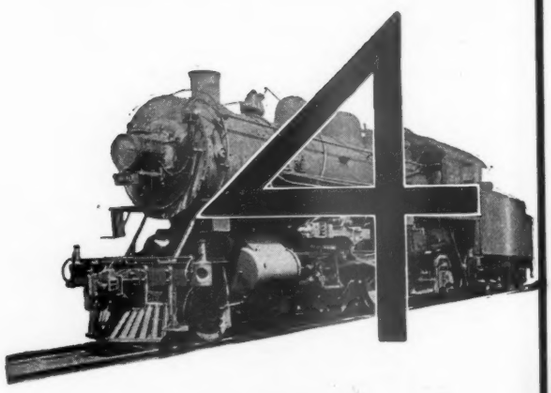
Financial Section—The New York Times

LIMA LOCOMOTIVE WORKS INCORPORATED

LIMA ENGINEERS

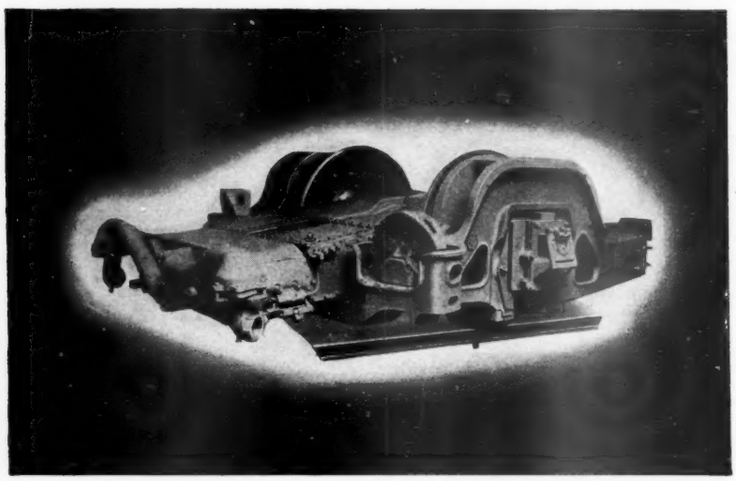
Can Help Cut Your Operating Costs

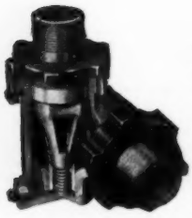
WHETHER 4



OR

EVERY LOCOMOTIVE

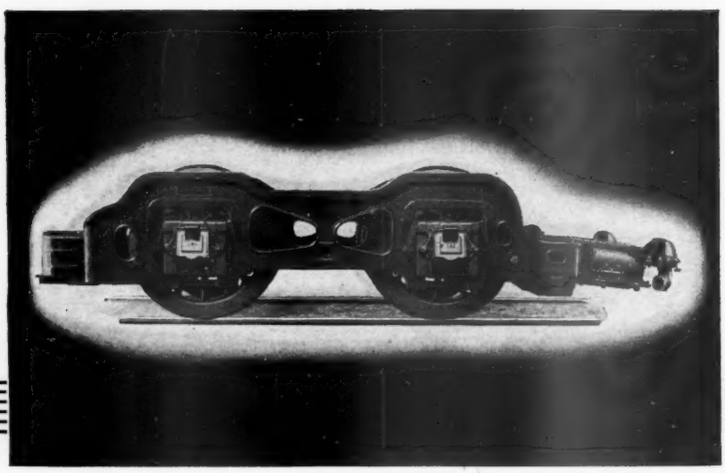




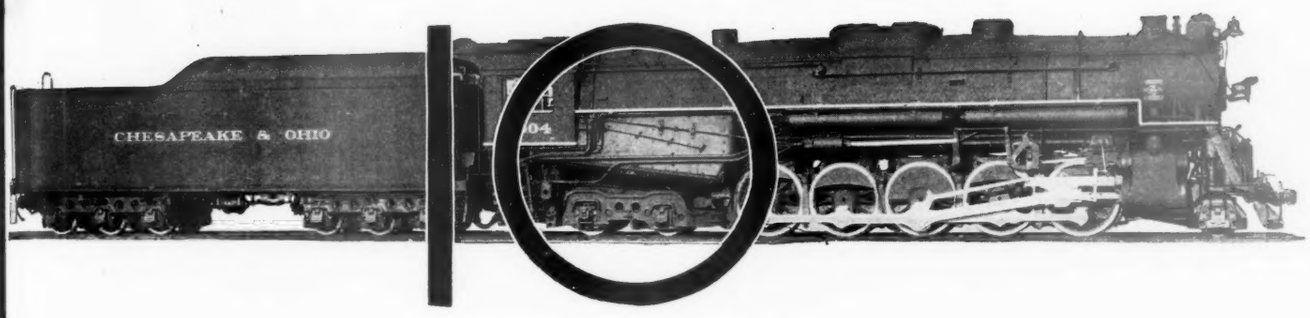
THE FRANKLIN SLEEVE JOINT

• • •

An improved flexible joint that gives long service with little attention.



DRIVERS



NEEDS THE BOOSTER

■ THE FIRST BOOSTER was applied to an Atlantic type locomotive. In this instance, it acted as an aid to four driving wheels in starting heavier loads.

■ Since then, over 4000 of these units of extra power have gone into service on locomotives having every modern driving wheel combination.

■ Recently, the new locomotives with ten drivers, built for the Chesapeake and Ohio Railway, were made the world's most powerful two-cylinder engines in service today due to the added tractive power the Booster provides.

■ Regardless of the number of drivers, whether four or ten, whether the locomotives are new or old, they all need the Booster.

■ The Booster overcomes old limitations in power at starting and in accelerating. Its thousands of pounds of additional tractive effort maintains speeds on grades.

■ Booster power is extra power, always available for use as demands fluctuate. It utilizes surplus steam to move trains faster. This intensified use of power increases operating efficiency as well as gross-ton-miles-per-hour. Every locomotive should be Booster-equipped.

FRANKLIN RAILWAY SUPPLY CO. INC.

NEW YORK CHICAGO
SAN FRANCISCO ST. LOUIS MONTREAL

Equipment and Supplies

LOCOMOTIVES

THE VICTORIA-ITABIRA (Cia. Estrada de ferro Victoria a Minas) has ordered one 4-6-2 type locomotive from the Baldwin Locomotive Works. Dr. Ceciliano Abel De Almeida, Rua Theophilo Ottoni, 72, Rio de Janeiro, Brazil, is general manager.

FREIGHT CARS

THE DELAWARE, LACKAWANNA & WESTERN has ordered 35 all-steel two-way automatic air dump cars of 30 cu. yd. capacity; 25 of these cars were ordered from the Magor Car Corporation and 10 from the Koppel Industrial Car & Equipment Company.

IRON & STEEL

THE NORTHERN PACIFIC is inquiring for 600 tons of structural steel for a bridge at Seattle, Wash.

THE LOUISVILLE & NASHVILLE is inquiring for 30,000 tons of structural steel for a bridge across the Ohio river at Henderson, Ky.

THE NORFOLK & WESTERN is inquiring for about 2,500 tons steel shapes, plates and bars for its requirements from April 1 to June 30.

THE CANADIAN NATIONAL has ordered 2,500 tons of steel for the Dorchester street bridge at Montreal, Que., from the Dominion Bridge Company.

THE INDIANA HARBOR BELT has ordered 1,900 tons of structural steel for miscellaneous bridge work from the Mississippi Valley Structural Steel Company.

SIGNALING

THE CONSOLIDATED RAILROADS OF CUBA have ordered from the General Railway Signal Company two Saxby & Farmer interlocking plants; eight levers each.

THE CANADIAN PACIFIC has ordered from the Union Switch & Signal material for the installation of automatic block signals on its line between Vaudreuvil, Ont., and Bedell, 84 miles, double track. The order includes 125 searchlight signals, 425 relays and other apparatus.

THE UNION PACIFIC plans to install this year automatic color-light block signals between Gibbon, Neb., and Hastings, at a cost of $86,500; and automatic block signals between Menoken, Kan., and Upland, at a cost of $206,000. The reconstruction of a signal pole line between Kansas City, Kan., and Perry will involve an expenditure of $60,000. At Kansas City an electric interlocking plant will be installed at Terminal Junction at a cost of $101,500.

Supply Trade

Oliver F. Gang has been appointed assistant sales manager of **The Wm. Powell Company,** Cincinnati, Ohio.

The Curtin-Howe Corporation, New York, has moved its executive offices from 11 Park Place to the Chrysler building, 405 Lexington avenue.

George L. Niederst, for the past 20 years, chief engineer of the Orton Crane & Shovel Company, Chicago, has left that company to become engineering sales representative of **Thomas D. Crowley & Company,** railroad representatives for the Orton Crane & Shovel Company.

Walter H. Wiewel has been appointed sales manager of **The Timken Steel & Tube Company,** Canton, Ohio replacing A. J. Sanford, resigned. Mr. Wiewel has been associated with the company for several years as manager of steel sales in New York City. He will have his headquarters at Canton.

Glenn W. Christopher, manager of the bar and wire sales of the **Youngstown Sheet & Tube Company,** Youngstown, Ohio, has been promoted to assistant manager of pipe and sales, and has been succeeded by **William W. Brown,** district manager of sales at Pittsburgh, Pa., who, in turn, has been succeeded by **Guy B. Strausner,** district manager at Buffalo, N. Y. Mr. Strausner has been succeeded by **Clyde F. Andler,** district manager at Youngstown, and the latter has been succeeded by **Earl H. Braunbern,** assistant district sales manager at Youngstown. **Robert D. MacKenzie,** acting district sales manager at Cleveland, Ohio, has been appointed district sales manager to succeed G. G. Stuart, deceased.

At the annual meeting of the stockholders of the **Monighan Manufacturing Corporation,** which was recently acquired by the **Bucyrus-Erie Company,** the stockholders voted to change the name of the company to the **Bucyrus-Monighan Company.** This action has also been approved by the board of directors of the Bucyrus-Erie Company. The Bucyrus-Monighan Company will operate as a separate organization, except that sales will be handled by the Bucyrus-Erie sales organization. Officers of the Monighan Company were re-elected as officers of the Bucyrus-Monighan Company, while **W. W. Coleman,** president, and **G. A. Morison,** vice-president and treasurer of the Bucyrus-Erie Company, were elected chairman and vice-chairman of the Bucyrus-Monighan Company respectively.

Edward C. Bullard, vice-president and director of **The Bullard Company,** Bridgeport, Conn., has been appointed general manager of that company to succeed his uncle, the late Stanley Hale Bullard. Mr. Bullard is the first of the third generation of the family to assume so important a position in the organization. He is a native of Bridgeport, and received his early education in the Curtis School, Brookfield, and in The University School, Bridgeport, where he prepared for Yale (Sheffield) Scientific School from which

Edward C. Bullard

he was graduated in 1917 with honors. After familiarizing himself by actual contact with the duties of the several divisions of The Bullard Company plant, he was made assistant to his father, Dudley B. Bullard, chief engineer, in 1926. Three years later he was appointed an engineer in charge of design and research, and in 1930 was elected a vice-president of the company.

Timken Roller Bearing Company

The annual report of the Timken Roller Bearing Company for the year ending December 31, 1930, shows a net profit of $7,524,122, after all expenses, as compared with $14,155,414 in 1929. Manufacturing profit totaled $11,250,069, after deducting all manufacturing costs, including materials, labor, factory expense and depreciation to the amount of $1,992,884. This compares with a manufacturing profit of $19,954,383 in 1929. Dividends paid during the year amounted to $7,236,423, as compared with $7,223,472 in 1929, while the surplus increased from $40,457,721 in 1929 to $40,782,023 in 1930.

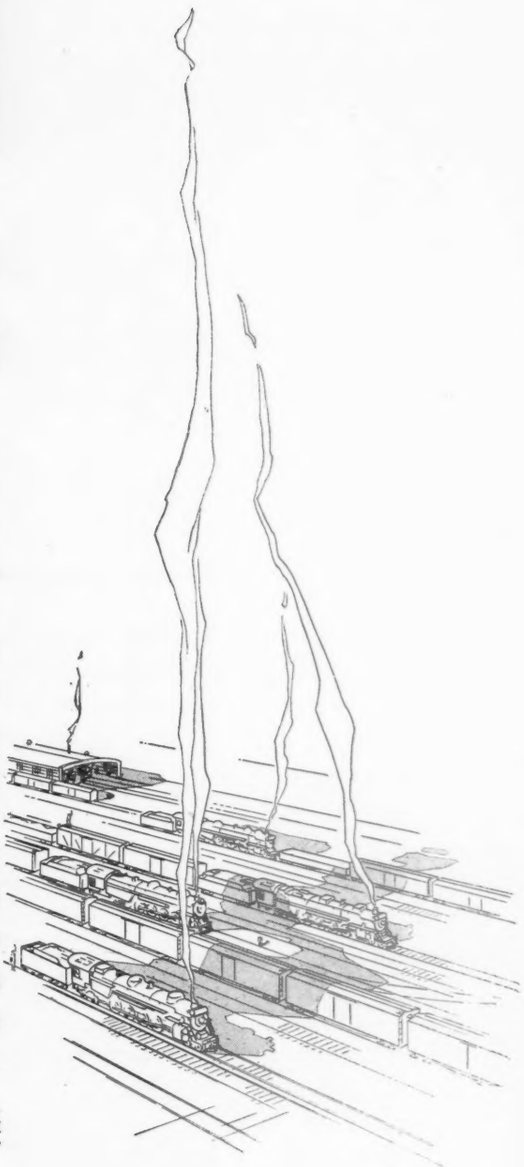
The income account for the year ending December 31, 1930, follows:

	1930	1929
Manufacturing profit, after deducting cost of goods sold, including materials, labor, factory expense and depreciation in the amount of $1,992,884	$11,250,069	$19,954,383
Selling, administrative and general expenses	3,409,596	3,760,090
Operating profit	$7,840,473	$16,194,293
Idle plant expense—Wooster	63,112	.....
Extraordinary charges covering: obsolescence of plant property and possible shrinkage in inventories	.....	385,463
Provision for contingencies	.....	400,000
Less: Adjustment re machinery and equipment	.....	14,571
Other deductions: net exclusive of interest earned and federal taxes	17,290	173,075
Profit before interest earned and federal taxes	$7,794,652	$15,250,326
Interest earned	619,470	680,088
Profit before federal taxes	$8,414,122	$15,930,414

Continued on Second Left Hand Page

GET ENGINEERING COUNSEL WITH YOUR ARCH BRICK

■ EVERY major development in this locomotive Arch has come from the American Arch Company. When the old, cumbersome slabs gave way to Arch Tubes and easily handled sections of brick, the American Arch Company was responsible for the change. Later, the introduction of the stoker brought new conditions in the firebox, but American Arch Company engineers were ready with suitable Arch designs. The Syphon again changed locomotive combustion, and once more American Arch Company engineers revised the Arch to harmonize with the new conditions. For years past practically every new design of locomotive has had the Arch designed by American Arch Company. This engineering service is one of the important elements in satisfactory Arch Brick service. American Arch Company, alone, is qualified by experience to supply it.



THERE'S MORE TO SECURITY ARCHES THAN JUST BRICK

HARBISON-WALKER REFRACTORIES CO.
Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED
Locomotive Combustion Specialists

To Haul Full Tonnage Freight

THE Lehigh Valley Railroad needed a locomotive that could haul full tonnage freight trains at passenger train speeds and extra heavy passenger trains on regular schedule, as part of its plan to expedite service over its entire line and at the same time reduce operating expenses.

The American Locomotive Company, to meet these exacting requirements, has completed at its Schenectady Shops a new locomotive that is veritably a meteor of steam and steel.

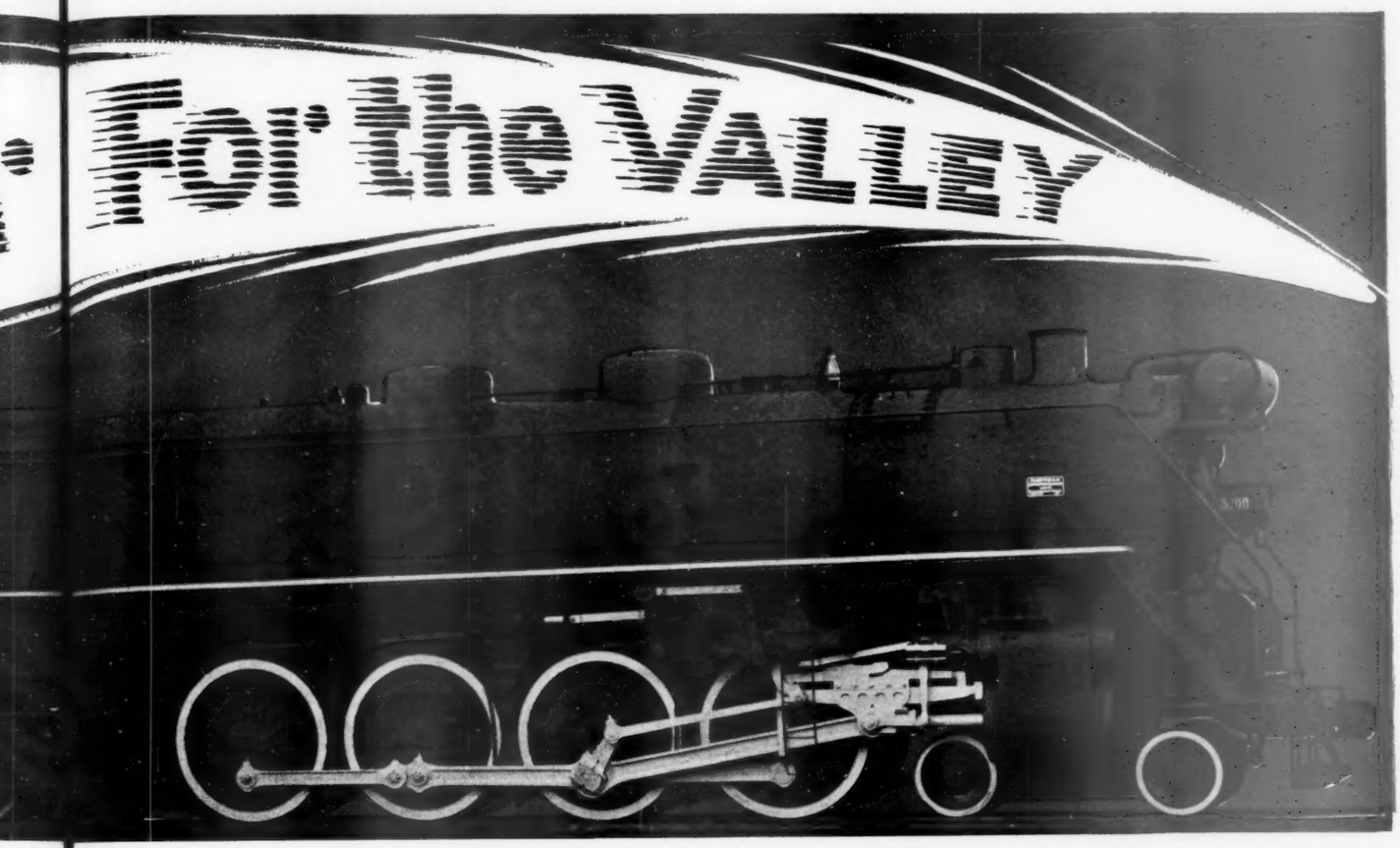
This locomotive represents many changes from previous Lehigh Valley construction. The most modern safety, power producing, fuel and labor saving devices are employed and when the locomotive is placed in service many new performance records and new economies are confidently expected.

This new meteor of the Valley is a 4-8-4 type locomotive having a four-wheel engine truck, four pairs of drivers and a four-wheel trailing truck.

With the 26 x 32 inch cylinders, a steam pressure of 255 lb. and driving wheels 70 inches in diameter, the locomotive develops with its booster a starting effort of 85060 lb.

AMERICAN LOCO

30 CHURCH STREET



Trains at Passenger Train Speeds

IT is approximately 108 feet in length over all and with tender weighs 780,800 lb. The large tender capacity of 18,000 gallons of water and 28 tons of coal makes possible the contemplated long runs without stops.

The graceful "stream" lines of this locomotive are an outstanding feature which have caused considerable favorable comment. For quite some time Alco Engineers have made a determined effort to remove all piping from the sides of the boiler in order to create a clean, clear cut flowing effect which now has become a distinguishing identification for an Alco engine.

This new triumph of dynamic symmetry combines immense power, high speed, sustained capacity, remarkable economy of operation and grace of lines.

It is a striking example of the extraordinary benefits that can be obtained through the hearty cooperation of the railroad's Mechanical Officials and Alco Engineers all working for a common purpose—greater haulage at lower costs—greater efficiency—better service for the traveling public and shippers. It is such cooperation that will keep the steam locomotive as the main prime mover and the railways as the outstanding method of transportation.

MOTIVE COMPANY

NEW YORK CITY

	1930	1929
Profit before federal taxes	$8,414,122	$15,930,414
Provision for estimated federal taxes	890,000	1,775,000
Net profit	$7,524,122	$14,155,414

President M. T. Lothrop, in his statement to stockholders, said in part:

"Despite the fact that the railroad equipment industry has just passed through one of its worst years in the last 25, we have made considerable headway in the development of Timken bearings for railway rolling stock and locomotives. Some outstanding Timken bearing railroad applications made during 1930 were for coaches, de luxe coaches, dining cars, Pullman cars, engine trucks and engine tenders purchased by various American railroads, including the Long Island, the Central of New Jersey, the Chesapeake & Ohio, the Northern Pacific, the Canadian National and the Pennsylvania. Timken bearing equipped street cars were purchased by the Lima Light, Power & Tramways, Lima, Peru.

"Timken bearings are now in service and under test on 138 steam railways and 31 electric railways.

"The Timken 4-8-4 steam locomotive having Timken bearing equipment on all wheels, including the drivers, booster, train control and valve pilot, placed in service in April, 1930, has completed demonstration tests approximating 50,000 miles. To date this Timken locomotive has been operated on several railroads and has demonstrated an ability to handle fast freight trains, averaging 100 cars each, at speeds in excess of 50 miles per hour. It has handled heavy coal trains with 134 cars at the maximum speed permissible on equipment of this type, and, without making any adjustments, has handled fast passenger trains including some of the 20-hr. trains between New York and Chicago, and the Sportsman between Toledo, Ohio, and Clifton Forge, Va., making the schedule with ease.

"The Timken 100-car freight train has now had one year's service in the transportation of coal between the Pennsylvania coal fields and tide water. No repairs or maintenance charges of any kind have been chargeable to this equipment. The Timken bearings received attention for lubrication only four times during the year, whereas plain bearings require daily inspection. All of the advantages claimed for antifriction bearings are being demonstrated to the satisfaction of the railroad operators."

The Inland Steel Company

The annual report of the Inland Steel Company for the year ending December 31, 1930, shows net profits of $6,498,967, as compared with $11,712,374 for the previous year, after interest, taxes, depreciation and contributions to the employees' fund. This is equivalent, after preferred dividends, to $5.41 per share on the 1,200,000 shares of no par value common stock outstanding, as compared with $9.76 a share in 1929. The amount carried to surplus was $1,698,967, as compared with $7,512,374 in 1929. The consolidated income and surplus account for the year ending December 31, 1930, follows:

	1930	1929
Gross income	$51,756,845	$68,585,431
Cost of sales, including selling, general and administrative expenses	40,823,195	51,868,928
Net earnings after deducting all expenses incident to operations, including charges for repairs and maintenance	$10,933,650	$16,716,503
Other income (interest received)	706,480	993,244
	$11,640,130	$17,709,747
Less:		
Provision for depreciation of plants and exhaustion of minerals	2,722,413	2,748,623
Bond interest	1,293,750	1,329,750
Estimated Federal taxes	783,000	1,319,000
	$6,840,967	$12,312,374
Deduct: Contribution to employees' savings and profit sharing pension fund	342,000	600,000
Net profit for year	$6,498,967	$11,712,374
Deduct:		
Regular dividends paid on capital stock	4,800,000	4,200,000
Surplus income for year	$1,698,967	$7,512,374
Add balance of surplus end of previous year	30,906,130	23,383,755
Surplus, December 31, 1930, as per balance sheet	$32,605,097	$30,906,129

OBITUARY

Stanley Andrew Mallette, treasurer of the American Car & Foundry Company, died in his home at Scarsdale, N. Y., on March 27, after a brief illness. Mr. Mallette was born at Union City, Conn., in 1870 and had been connected with the

Stanley Andrew Mallette

American Car & Foundry for 32 years. Entering the employ of the company in 1899, as a clerk in the treasury division, he was advanced in June, 1903, to assistant treasurer and in February, 1925, he became treasurer of the company.

Edward Dwight Priest, retired engineer in the railway department of the General Electric Company and an authority on railway electrification, died at his home in Schenectady, on March 26. Mr. Priest was born at Northfield, Mass., on November 9, 1861. He received his common school education near his home and entered the Worcester Polytechnic Institute in 1880 from which place he was graduated in 1884, with the degree of B. S. in mechanical engineering. A short time after his graduation he returned and continued his studies, this time in the field of electrical engineering. His first experience in the business world was as a designer and draftsman with the Van Depoelle Company which was later merged with the Thomson-Houston Company of Lynn, Mass. In 1895, Mr. Priest was made designing engineer for the General Electric Company in charge of railway motors. He was the originator of the G. E. motor in 1898 which was the first box frame type marketed by that company. It was cast in one piece and was so capably designed that it remains generally in use today. During the 34 years which Mr. Priest spent in the General Electric employ, he was continuously engaged in railway electrification problems and contributed valuable ideas to their development.

Construction

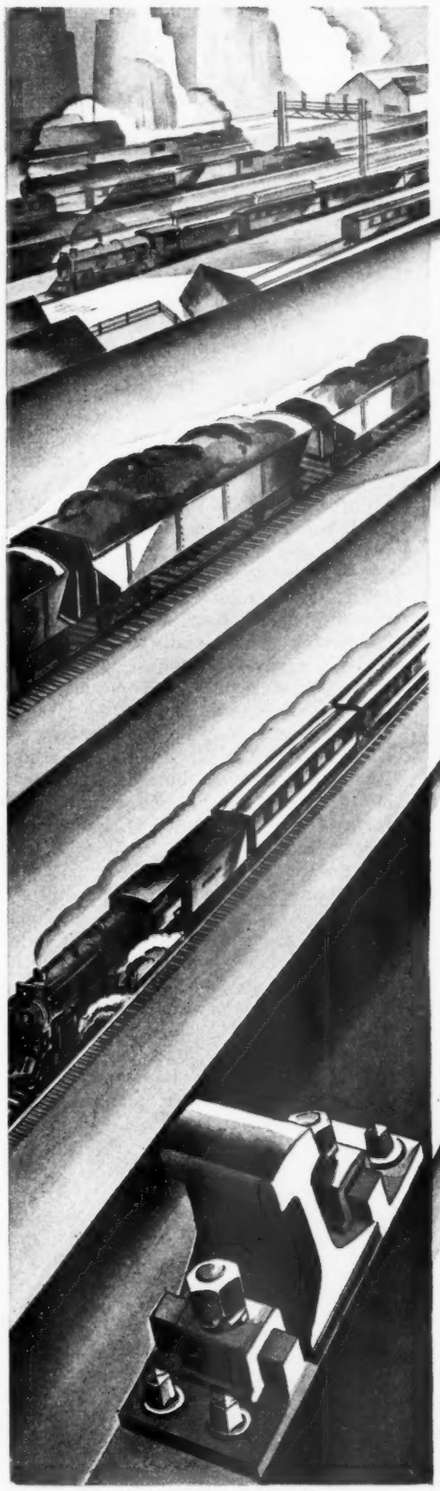
BALTIMORE & OHIO.—In order to increase the capacity of this company's automobile unloading facilities at Oak street, Baltimore, Md., the present platform is being extended 50 ft., and it is planned to cover the entire platform. This will provide room for placing 14 or 15 cars, including the present six-car track. In addition, a depressed track is being installed along Twenty-first street on the north side of the platform. The cost of these additional facilities is estimated at approximately $31,500.

CANADIAN NATIONAL.—Contracts have been awarded for construction of the Dorchester Street bridge, part of the C. N. R.'s Montreal (Que.) terminal project, and it is anticipated that the work will be completed and the bridge in service by September 30. Foundations are to be placed by the Northern Construction Company and J. W. Stewart, to whom the contract for completion of the excavation work and placing of certain foundations was awarded, while the steel structure will be fabricated and erected by the Dominion Bridge Company. Approximately 2,500 tons of steel will be required. The new bridge will be 104 ft. in width, to conform with the new line of Dorchester street between Beaver Hall hill and Guy street. Plans provide for several safety features, particularly as regards pedestrians' use of the bridge, which will allow street car passengers to reach the concourse of the new passenger terminal without having to cross through any vehicular traffic on the bridge. The bridge will carry double track street car lines, with sufficient width of roadway for three lanes of vehicular traffic between the street car tracks and the 16-ft. sidewalks on either side. Safety islands, connecting directly with the station concourse by stairways and escalators will be constructed just east of Mansfield street so that passengers will move to and from the new stations without risk of accident from vehicles using the bridge. Another feature of the new structure will be the building, underneath the sidewalks, of conduits to carry all wires necessary for electrical and other public services, thus removing overhead wires from the bridge except in the case of the trolley wires required for street car services.

CANADIAN PACIFIC.—The general contract for the construction of a post office and a telegraph building at Regina, Sask., has been let to Bird, Woodall & Simpson, Regina. The post office building will have outside dimensions of 90 ft. by 90 ft., while the telegraph building will be 80 ft. by 60 ft. Bids were received until March 26 for the construction of a power plant building to house a central heating system for the passenger terminal.

CHARLESTON & WESTERN CAROLINA.—This company is rebuilding its bridge over the Savannah River at Sandbar Ferry, near Augusta, Ga. After reconstruction, the bridge proper will consist of one 155-ft. through truss Scherzer lift span, three

Continued on Next Left Hand Page



MORE TRAINS
HEAVIER TRAINS
FASTER TRAINS
demand
GEO

SMOOTH and practically noiseless track, control of rail movement, reduction in rail wave motion, longer life of rails and ties, radically reduced maintenance costs, greater safety . . . these are the important advantages of G E O—the modern track construction which is attracting the favorable attention of progressive railroad officials in search of equipment adequate to the demands of present-day traffic.

G E O is not a new, untried device. Many thousands of miles of G E O track have been laid in Europe where it has been adopted as standard construction in several countries. In Germany alone, more than 7900 miles of G E O track have been laid within the last five years. Here in America, tests on leading railroad systems are already demonstrating its outstanding merit.

Descriptive literature will be sent at your request, and Carnegie engineers are at your service at all times.

GEO

CARNEGIE STEEL COMPANY - PITTSBURGH

Subsidiary of United States Steel Corporation

128

TRACK CONSTRUCTION

155-ft. through truss spans and two 101-ft. through truss spans. The east approach will consist of three 64-ft. deck plate girder spans and 24 eighteen-foot reinforced concrete slab spans, while the west approach will include four 90-ft. deck plate girder spans and 105 eighteen-foot reinforced concrete slab spans with ballast deck, giving a total length over all of 3,730 ft. Masonry for the support of the superstructure and the concrete trestle will be installed by C. & W. C. company forces, while steel for the superstructure will be fabricated by the American Bridge Company and erected by the railroad's bridge forces.

CHESAPEAKE & OHIO.—A contract for the enlargement and relining of Lakes tunnel, Backbone, Va., at a probable cost of $306,000, authorization for which was reported in the *Railway Age* of March 28, has been awarded by this company to Sturm & Dillard, Columbus, Ohio. Authority has also been given for the moving of a 100-ft. turntable from Clifton Forge, Va., to Cheviot, Ohio, at an estimated cost of $27,700. Newspaper reports indicate that the villages of Raceland, Ky., and Worthington, by recent approval of the abandonment by the C. & O. of an underground crossing between the two points, have removed one obstacle to work in connection with the enlargement of the westbound receiving and classification yards at Russell, Ky., a project which was authorized by the railroad over a year ago, as reported in the *Railway Age* of March 29, 1930, and which will cost between $500,000 and $600,000.

CINCINNATI UNION TERMINAL.—A general contract for the construction of the Union Passenger station in the Mill Creek district of Cincinnati, Ohio, near Lincoln park has been awarded to James Stewart & Company, New York, at a cost of $5,887,000. It is expected that construction of the foundations will begin April 15. The structure is to be ready for occupancy January 1, 1933. A contract for 237 units of frogs and switches and 46 double slip switches in passenger terminal trackage has been awarded to the Weir-Kilby Corporation, Cincinnati, at a cost of about $250,000. A contract for the construction of reinforced concrete abutments and the viaduct which will carry tracks of the south throat of the passenger terminal yards over Eighth street viaduct at a cost of approximately $100,000 has been awarded to August J. Henkle, Cincinnati. This structure will be 140 ft. long and 120 ft. wide and will carry six tracks.

ERIE.—This company has been directed by the Public Service Commission of New York to file revised plans for the elimination of grade crossings at Pennsylvania avenue, Chemung Place, and Henry, Hudson, Water, Market, Gray, Church, First and Second streets, all in Elmira, N. Y. The revised plans are expected to eliminate objections raised by the New York State Department of Public Works to plans previously approved, and should permit the starting of the entire elimination program within the next few months.

GREAT NORTHERN.—This company has applied to the Interstate Commerce Commission for authority to construct a new line between Bend, Ore., and Lava, 14.3 miles, on the east side of the Deschutes river, and to suspend operation over the existing line on the west side of the river, 15.39 miles

LOUISVILLE & NASHVILLE.—A contract has been let for the construction of six storage tanks at Pensacola, Fla., to handle whale oil from ocean steam ships. Two of the tanks will each have a capacity of 500,000 gal., and four will have a capacity of 250,000 gal. each.

MISSOURI PACIFIC.—The American Refrigerator Transit Company has awarded a contract to the Mountain Ice Company, St. Louis, Mo., for the construction of a car icing plant at Leeds, Mo., at a cost of $250,000. This plant, which will be located on Missouri Pacific property, will include an ice manufacturing plant, with a capacity of 100 tons daily, and storage capacity for 5,000 tons, and an icing dock at which 120 cars can be handled at one time. Company forces will construct new tracks and yard facilities in connection with the plant at an additional cost of $100,000. Construction of the plant is being undertaken for the purpose of speeding up the handling of perishable freight through the Kansas City gateway and to avoid congestion in the East Bottom yards at Kansas City, where the present Missouri Pacific icing facilities are located. It is expected that the project will be completed by July 1.

NEW YORK CENTRAL.—The New York Public Service Commission has approved plans and specifications for the elimination of Purdy's crossing on the Peekskill-Salem Center county highway, North Salem, N. Y.

NORTHERN PACIFIC.—The Interstate Commerce Commission has authorized this company to build an industrial track from a point 1.1 miles west of Butte, Mont., south to a connection with the Chicago, Milwaukee, St. Paul & Pacific, 1.6 miles. The new track, which is to serve industries in the southern part of the city of Butte, will cost about $53,548.

NORWOOD & ST. LAWRENCE.—This company and the Borrman Stone Products Company, Inc., have been authorized by the Public Service Commission of New York to construct a side track 2,200 ft. long, connecting the railroad with the Borrman Company's stone quarry at Norfolk, N. Y. The track will be built by the Borrman Company and operated by the railroad.

PUBLIC SERVICE COMMISSION OF NEW YORK.—The Pierce (Peterson) grade crossing of the Lehigh Valley three miles northeast of Homer station, Truxton, N. Y., has been added to the New York Public Service Commission's list of crossings to be considered for elimination during 1931, as has the Ludwig (Violet) avenue crossing of the Delaware, Lackawanna & Western, Erie, and Lehigh Valley in Cheektowaga, N. Y.

READING.—Bids will be invited sometime in April for the construction of a passenger station, 40 ft. by 111 ft., to serve Jenkintown, Pa., and Wyncote. The new building, on the site of the present structure, is to be built of local stone trimmed with limestone, and includes covered platforms on both sides of the tracks.

UNION PACIFIC SYSTEM.—This system plans to expend $1,750,000 during 1931 for new construction and maintenance to improve its Gibbon(Neb.)-Topeka(Kan.) freight cut-off line and bring it to main-line standards. Included in the budget for that line are the following items of new construction: New stock yard and yard trackage at Hastings, Neb., $34,000; new 450-ton capacity steel coaling station, brick sand drying house and sand bin at Marysville, Kan., $134,000; passing sidings at Nolan, Kan., Sullivan, Winifred, and Hollenberg, $60,000; bridge work at Winifred, Kan., Frankfort, and Hull and between Broughton, Kan., and Relock, $94-000; bank widening west of Duluth, Kan., $17,500; telegraph line construction between Menoken, Kan., and Upland, $7,500. This company also plans to expend $233,-000 for a new roundhouse at Cheyenne, Wyo., and $126,000 for improvements to the passenger terminal, and $103,000 for additional yard trackage at the same point. A new brick freight station at Laramie, Wyo., with outside dimensions of 38 ft. by 142 ft. and a covered concrete platform 38 ft. wide by 140 ft. long will be constructed at a cost of $147,000. Improvements in the wood-preserving plant at Laramie will involve an expenditure of $27,000. At Columbus, Neb., additional yard trackage and development of industrial property will involve an expenditure of $80,000. A new one and one-half story reinforced concrete warehouse having outside dimensions of 80 ft. by 100 ft. will be constructed at Portland, Ore., at a cost of $50,000. At the same point, a one-story frame freight station will be constructed at Fir station, Portland, at a cost of $14,000.

* * *

Interior of a Buffet Car Built by the Sorocabana Railway of Brazil in Its Company Shops

Continued on Next Left Hand Page

Rely on Illinois when you need prompt service

ILLINOIS
TIE PLATES AND ANGLE BARS

Illinois Steel Company
SUBSIDIARY OF UNITED STATES STEEL CORPORATION
208 South La Salle Street, Chicago, Ill.

Financial

AKRON, CANTON & YOUNGSTOWN.—*Notes.*—The Interstate Commerce Commission has authorized this company to issue $400,000 of short term promissory notes and to renew them from time to time for periods not exceeding two years. The notes are to bear interest at not more than 6 per cent.

ATCHISON, TOPEKA & SANTA FE.—*Acquisition.*—The Interstate Commerce Commission has authorized the Panhandle & Santa Fe to acquire control by lease of the North Texas & Santa Fe, extending from Spearman, Tex., to Shattuck, Okla., 84 miles.

BALTIMORE & OHIO.—*Intervention of Stockholders in Alton Case Opposed.*—This company has filed with the Interstate Commerce Commission a memorandum opposing the petition filed by the protective committee representing stockholders of the Chicago & Alton which had asked to be allowed to intervene in the proceedings on the application of the Baltimore & Ohio for authority to acquire control of the property of the Alton. The stockholders have also filed a reply brief insisting on their right to be heard by the commission and asking for oral argument on the question if there be any doubt in the commission's mind.

BANGOR & AROOSTOOK.—*Annual Report.*—The Annual Report of this company for 1930 shows net income, after interest and other charges, of $1,557,761, as compared with net income in 1929 of $1,398,432. Selected items from the Income Statement follow:

	1930	1929	Increase or Decrease
Average mileage operated	613.80	613.78	+ .02
RAILWAY OPERATING REVENUES	8,365,756	8,135,673	+230,083
Maintenance of way	1,434,511	1,303,872	+130,638
Maintenance of equipment	1,503,102	1,662,348	—159,246
Transportation	1,997,747	1,953,561	+ 44,186
TOTAL OPERATING EXPENSES	5,350,237	5,340,513	+ 9,723
Operating ratio	63.95	65.64	— 1.69
NET REVENUE FROM OPERATIONS	3,015,519	2,795,159	+220,359
Railway tax accruals	700,879	613,720	+ 87,159
Railway operating income	2,314,202	2,181,253	+132,948
Hire of freight train cars	26,599	99,442	— 72,842
Joint facility rents	10,464	10,415	+ 49
Non-operating income	139,206	176,668	— 37,462
GROSS INCOME	2,453,408	2,357,922	+ 95,486
Interest on funded debt	866,777	932,541	— 65,764
TOTAL DEDUCTIONS FROM GROSS INCOME	27,037	23,533	+ 3,504
NET INCOME	1,557,761	1,398,432	+159,328

CHICAGO & EASTERN ILLINOIS.—*Annual Report.*—The annual report of this road for 1930 shows a net deficit, after interest and other charges, of $7,251,680, as compared with net income of $478,968 in 1929. Selected items from the income statement follow:

	1930	1929	Increase or decrease
Average Mileage operated	946.24	946.24	.....
RAILWAY OPERATING REVENUES	19,784,299	25,398,275	—5,613,976
Maintenance of way	2,210,561	3,011,915	801,354
Maintenance of Equipment	*9,280,045	5,356,769	+3,923,275
Transportation	8,306,537	9,360,419	—1,053,882
TOTAL OPERATING EXPENSES	21,701,496	19,693,097	+2,008,398
Operating ratio	109.69	77.53	+32.16
NET REVENUE FROM OPERATIONS	*1,917,196*	5,705,177	—7,622,374
Railway tax accruals	1,683,000	1,670,000	+13,000
Railway operating income	*3,606,085*	4,026,307	—7,632,393
Equipment rents — Net — Dr.	1,218,005	1,186,814	+31,191
Joint Facility rents — Net — Dr.	681,876	630,459	+51,416
NET RAILWAY OPERATING INCOME	*5,505,968*	2,209,032	—7,715,001
Non-operating income	582,741	617,058	—34,316
GROSS INCOME	*4,923,227*	2,826,090	—7,749,318
Rent for leased roads	155,126	155,535	—408
Interest on funded debt	1,933,452	2,126,353	—192,901
TOTAL DEDUCTIONS FROM GROSS INCOME	2,328,453	2,347,122	—18,669
NET INCOME	*7,251,680*	478,968	—7,730,648
Disposition of net income:			
Appropriation of income for sinking fund.	177,500	177,500	.....
Interest on bonds in sinking fund	120,082	100,644	+19,438
Balance of income transferred to Profit and Loss.	*7,549,263*	200,823	—7,750,087

* Includes $4,700,000 special retirement of equipment.
Italics denote deficit.

GENESEE & WYOMING.—*Securities.*—The Interstate Commerce Commission has authorized this company to renew for six months a 5 per cent promissory note for $300,000 and to repledge as security therefor $400,000 of its 5 per cent first mortgage bonds.

GULF, MOBILE & NORTHERN.—*Burlington Officers Elected Directors.*—F. E. Williamson, president of the Chicago, Burlington & Quincy, and C. E. Spens, executive vice-president of that railroad, have been elected members of the board of directors.

MAINE CENTRAL.—*Annual Report.*—The 1930 Annual Report of this road shows net income, after interest and other charges, of $1,112,099, as compared with net income of $1,746,256 in 1929. Selected items from the income statement follow:

	1930	1929	Increase or decrease
Average Mileage operated	1,121.42	1,122.15	—.73
RAILWAY OPERATING REVENUES	18,993,373	20,312,269	—1,319,895
Maintenance of way	2,839,346	2,848,567	—9,200
Maintenance of Equipment	3,588,727	3,951,150	—362,422
Transportation —Rail Line	7,026,638	7,346,026	—319,387
TOTAL OPERATING EXPENSES	14,345,945	15,067,261	—721,316
Operating ratio	75.54	74.18	—1.36
NET REVENUE FROM OPERATIONS	4,646,428	5,245,008	—598,579
Railway tax accruals	1,065,100	1,127,687	—62,587
Railway operating income	3,580,979	4,116,658	—535,679
Hire of freight cars—Dr.	153,140	79,409	+73,731
Joint Facility rents	467,189	399,618	+67,571
Non-operating income	487,630	474,271	+13,359
GROSS INCOME	4,068,610	4,590,930	—522,320
Rent for leased roads	758,749	803,526	—44,777
Interest on funded debt	1,270,797	1,240,882	+29,914
TOTAL DEDUCTIONS FROM GROSS INCOME	2,956,510	2,844,673	+111,837
Disposition of net income:			
Dividend appropriations of Income (Pref. Stock)	150,000	150,000	.....
Income Balance Transferred to Profit and Loss	962,099	1,596,256	—634,157

PENNSYLVANIA.—*Annual Report.*—The 1930 annual report of this company shows net income, after interest and other charges, of $68,809,817, as compared with a net income of $101,378,518 in 1929. Selected items from the income statement follow:

	1930	Increase or Decrease compared with 1929
Average Mileage operated	10,959.63	+380.82
RAILWAY OPERATING REVENUES	570,465,360	—112,237,570
Maintenance of way	68,473,843	—19,373,531
Maintenance of Equipment	110,960,175	—20,682,605
Transportation	210,423,591	—24,767,345
TOTAL OPERATING EXPENSES	427,183,181	—65,967,411
Operating ratio	74.5	+2.4
NET REVENUE FROM OPERATIONS	143,282,179	—46,270,159
Railway tax accruals	35,661,756	—4,856,839
Railway operating income	107,473,167	—41,471,850
Hire of Equipment—Dr.	13,340,017	—776,505
Joint Facility rents—Dr.	1,951,592	+262,724
NET RAILWAY OPERATING INCOME	92,181,557	—40,958,069
Non-operating income	55,266,676	+6,475,177
GROSS INCOME	147,448,234	—34,482,892
Rent for leased roads	49,791,721	—651,108
Interest on funded debt	26,756,929	—1,020,806
TOTAL DEDUCTIONS FROM GROSS INCOME	78,638,416	—1,914,191
NET INCOME	68,809,817	—32,568,700
Disposition of net income:		
Income applied to sinking and other reserve funds	4,820,210	—142,641
Dividend appropriations of income (8 per cent)	52,030,987	+5,195,022
Balance transferred to credit of Profit and Loss, Dec. 31, 1930.	11,431,272	—37,494,322

PENNSYLVANIA.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $50,000,000 of general mortgage 4¼ per cent series D bonds

Continued on Next Left Hand Page

Helping reduce engine troubles to ZERO

BOILER TUBES

that have built into them an extra measure of strength, durability and resistance to pitting —combined with the qualities that make for efficient beading and holding in the flue sheet, are obviously the tubes that cut down replacements and help reduce engine troubles to zero.

NATIONAL-SHELBY Seamless Locomotive Boiler Tubes are made to one high standard only and that standard includes every quality necessary to meet the most exacting requirements of modern railway service. Ask for Bulletin No. 12, describing NATIONAL-SHELBY Seamless Tubes—

America's Standard Boiler Tubes

US STEEL

NATIONAL TUBE COMPANY, Pittsburgh, Pa.

Subsidiary of United States Steel Corporation

NATIONAL SEAMLESS

maturing in 1981. The proceeds of the issue will be used to refund a like amount of series C 6 per cent bonds and is authorized for sale to Kuhn Loeb & Co., at 94, making the annual cost to the railroad approximately 4.56 per cent.

PITTSBURGH & WEST VIRGINIA.—*Notes.*—The Interstate Commerce Commission has authorized this company to issue $4,700,000 of 4½ per cent promissory notes to be sold at par—$5,000,000 of first mortgage bonds being pledged as collateral.

SOUTHERN.—*Annual Report.*—The 1930 annual report of this company shows net income, after interest and other changes, of $9,126,512, as compared with net income of $18,128,787 in 1929. Selected items from the Income Statement follow:

	1930	1929	Increase or Decrease
Average Mileage operated	6,731.02	6,730.64	+0.38
RAILWAY OPERATING REVENUES	118,868,607	143,183,948	—24,315,341
Maintenance of way	17,089,087	21,181,961	—4,092,874
Maintenance of Equipment	22,283,261	26,535,731	—4,252,470
Transportation	41,880,049	46,642,097	—4,761,948
TOTAL OPERATING EXPENSES	89,162,915	102,701,587	—13,538,672
Operating ratio	82.07	78.26	+3.81
NET REVENUE FROM OPERATIONS	29,705,691	40,482,360	—10,776,669
Railway tax accruals	8,383,820	9,320,685	—936,865
Hire of Equipment	624,311	107,158	+517,153
Joint Facility rents	977,878	994,981	—17,103
OPERATING INCOME	19,708,162	30,030,976	—10,322,814
Non-operating income	7,236,159	5,785,190	+1,450,969
GROSS INCOME	26,944,321	35,816,167	—8,871,846
Rent for leased roads	2,601,919	2,698,169	—96,250
Interest on funded debt	12,728,630	12,728,630	.....
NET INCOME	9,126,512	18,128,787	—9,002,275
Reserve for dividends on Preferred Stock	3,000,000	3,000,000	.....
Balance carried to Profit and Loss	6,126,512	15,128,787	—9,002,275

SOUTHERN PACIFIC.—*Abandonment.*—The Interstate Commerce Commission has authorized the El Paso & Southwestern to abandon and the Southern Pacific to abandon operation of a mile of line between Lowell, Ariz., and Bisbee.

SOUTHERN PACIFIC.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue and sell $50,000,000 of 50-year 4½ per cent gold bonds, to reimburse the treasury for expenditures in retiring bonds of subsidiary companies. The bonds are to be sold to Kuhn, Loeb & Co., at 94½ and interest.

VIRGINIAN.—*Operation.*—The Interstate Commerce Commission has authorized this company to operate under trackage rights over the Kanawha & Michigan (New York Central, lessor) from the Virginian's Deepwater bridge over the Kanawha river to Charleston, W. Va., 31 miles.

Average Prices of Stocks and of Bonds

	Mar. 30	Last week	Last year
Average price of 20 representative railway stocks.	83.39	87.26	138.06
Average price of 20 representative railway bonds..	92.54	93.26	94.21

Dividends Declared

Baltimore & Ohio.—Common, $1.25, quarterly; Preferred. $1.00, quarterly, both payable June 1 to holders of record April 18.

Carolina, Clinchfield & Ohio.—Common, 1 per cent, quarterly; Stamped Ctfs., 1¼ per cent, both payable April 10 to holders of record March 31.

Delaware, Lackawanna & Western.—$1.00, quarterly, payable April 20 to holders of record April 4.

International Railways of Central America.—Preferred, 1¾ per cent, quarterly, payable May 15 to holders of record April 30.

Midland Valley.—Common, $1.25, payable April 15 to holders of record March 31.

Norfolk & Western.—Adjustment Preferred. NET INCOME... 1,112,099 1,746,256 —634,157 $1.00, payable May 19 to holders of record April 30.

Reading Company.—Common, $1.00, quarterly, payable May 14 to holders of record April 16.

Railway Officers

EXECUTIVE

N. L. Howard, formerly president of the Chicago Great Western, has been elected chairman of the board of the North American Car Corporation, with headquarters at Chicago, a newly created position.

J. H. Day, freight traffic manager of the New York, Chicago & St. Louis, has been appointed vice-president in charge of traffic, with headquarters as before at Cleveland, Ohio, succeeding **J. W. Graham** who has been assigned to other duties.

H. R. Cole, superintendent of the Wyoming division of the Erie and the Wilkes-Barre & Eastern, with headquarters at Hornell, N. Y., has been appointed assistant to vice-president, succeeding **J. C. Tucker,** retired. **H. C. Barlow,** manager of freight claims, has been appointed special representative of the vice-president, with headquarters at New York, as before.

FINANCIAL, LEGAL AND ACCOUNTING

R. Manning, acting lease agent of the Southern Pacific, has been promoted to lease agent, with headquarters at San Francisco, Cal., succeeding **E. B. Leavitt,** who retired on pension on March 1, and who had been on a leave of absence since July 1, 1930.

The position of manager of freight claims of the Erie which was formerly held by **H. C. Barlow,** transferred, has been abolished, and **A. E. Pasman,** assistant manager freight claims, has been appointed to undertake Mr. Barlow's former duties, with the title of freight claim agent. **J. N. Brundage,** assistant manager of freight claims, has been appointed assistant freight claim agent, and a similar position has been assigned **R. T. Post.** All will have headquarters at New York.

Thomas J. Tobin, general accountant of the Erie, has been promoted to assistant comptroller, succeeding John K. Thompson, promoted. **Andrew J. Moran** has been appointed assistant comptroller in charge of revenues, his former title of auditor of freight accounts being abolished. **P. J. Reilly,** who has been in the service of the Erie for the past 61 years, has retired and his title of auditor of passenger accounts abolished. **Thomas F. Maher,** statistician, with headquarters at New York, has retired after 44 years of service.

James Stillwell, assistant general counsel for the Pennsylvania, with headquarters at Pittsburgh, Pa., has been transferred to Chicago, in charge of the newly created legal department of the Western region of that railroad. **Theodore Schmidt,** who has been associated with the law firm of Loesch, Scofield, Loesch & Richards at Chicago, has been appointed assistant general counsel, with headquarters in that city. **J. L. Aber,** assistant general solicitor at Pittsburgh, has been transferred to Chicago. **P. J. Cronin,** district claim agent at Chicago, has been promoted to chief claim agent of the Western region, with headquarters at the same point, with supervision over all the district claim agents in that region.

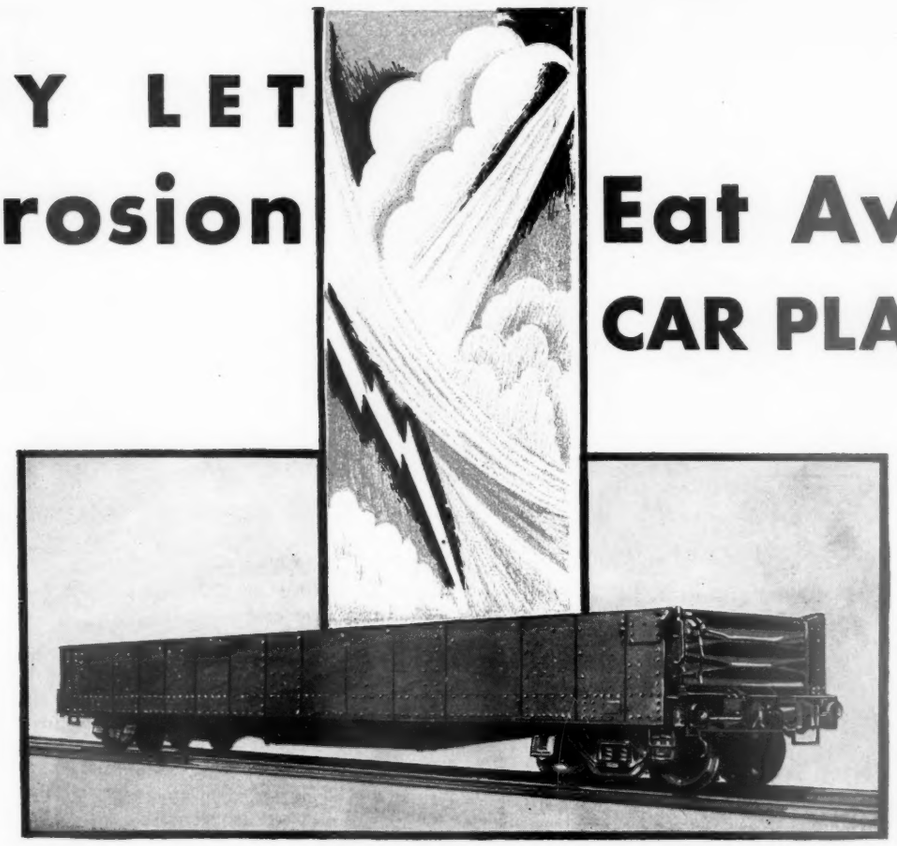
Mr. Schmidt, who has been appointed assistant general counsel at Chicago,

Theodore Schmidt

has practiced law in that city since 1909. He was born at Indianapolis, Ind., on March 15, 1884, and after graduating from Indiana University, obtained his law degree from the Northwestern University School of Law in 1909. Later he took a special course at the University of Chicago, and has been a lecturer on Illinois law at Northwestern University. For a number of years he has been associated with Loesch, Scofield, Loesch & Richards, the Pennsylvania's

Continued on Next Left Hand Page

WHY LET Corrosion Eat Away CAR PLATES?



■ ONCE THERE was nothing you could do to stop the inroads of rust and corrosion on car plates.

■ Heavier plates only provided a greater thickness of metal to be eaten through.

■ But now modern metallurgy has developed in Toncan Iron a car sheet that will resist rust and corrosion.

■ Toncan Iron has the natural corrosion resistance of iron fortified by alloying with copper and molybdenum.

■ The "corrosion factor" can now be discarded in designing freight cars, thus saving a ton in the weight of the average gondola.

Or, by maintaining the same weight of plate, the life of the car can be prolonged.

■ *Specify the economies of Toncan Iron for the new cars.*

REG. U.S. PAT. OFF.
TONCAN
COPPER
Mo-lyb-den-um
IRON

Central Alloy Division

REPUBLIC STEEL CORPORATION

General Offices: Youngstown, Ohio

solicitors at Chicago. His appointment as assistant general counsel became effective on April 1.

W. S. Hurt, assistant treasurer of the Norfolk & Western, was appointed treasurer of that road on April 1, succeeding **Joseph B. Lacy,** who retired on March 31. Mr. Hurt was born on July 12, 1868, at Wytheville, Va., and after finishing his education in the public schools at Wytheville, entered the service of the Norfolk & Western as a messenger, commencing his railroad career in 1880. In 1888, he was appointed assistant agent at Wytheville, and later that year

W. S. Hurt

he was transferred to Allisonia, Va., as agent and operator, where he remained for two years. In 1890, Mr. Hurt was again transferred, this time to Chilhowie, Va., where he remained eight months. In 1891, he went to Roanoke, Va., as clerk to the paymaster at that point. Later he was appointed pay clerk in the treasury department, and on June 20, 1918, he was promoted to cashier, which position he held until March 1, 1920, when he was appointed assistant treasurer, in which capacity he has continued until his recent appointment as treasurer.

Mr. Lacy was born at Lynchburg, Va., on March 29, 1861, and received his education in the public schools of that city. He began his railroad career in March, 1882, as clerk in the office of the assistant treasurer of the Norfolk & Western at Philadelphia, Pa. From 1887 to 1903, he served as paymaster and in the latter year he was promoted to assistant treasurer. Mr. Lacy was promoted to treasurer in March, 1905, the position he held until his retirement. He also served as treasurer of the Big Sandy & Cumberland.

Charles P. Crawford, comptroller of the Erie, retired on March 30, and **John K. Thompson,** assistant comptroller, has been appointed to succeed Mr. Crawford. Mr. Crawford was born at Salamanca, N. Y., and received a public school education. He entered railway service with the Erie as a freight clerk at Salamanca, in 1881. Subsequently he held the position of ticket clerk and chief clerk. He was appointed traveling auditor of station accounts in 1893; chief clerk, disbursements, in 1899; and chief

Charles P. Crawford

clerk in the auditor's office in 1902, and later served consecutively as auditor of disbursements, auditor of the Erie coal companies and auditor of the Erie Railroad until 1911, when he was appointed comptroller. During the period of gov-

John K. Thompson

ernment control of railroads, Mr. Crawford served as Federal auditor for the United States Railroad Administration.

Mr. Thompson was born at Paterson, N. J., on March 13, 1892, and attended the public schools of that city and the New York University Evening School, taking courses in commerce, accounts and finance. He entered the service of the Erie in September, 1907, as a clerk in the office of the auditor of traffic, being transferred to the comptroller's office in 1912, where he was successively bookkeeper, statistician, traveling accountant and assistant chief clerk. During a part of 1918 he was office accountant for the United States Railroad Administration at Washington, returning to the Erie in November, 1918, as general accountant. On March 1, 1920, he was promoted to assistant to comptroller, and on January 1, 1923, to assistant comptroller, in which capacity he served until his recent advancement.

George W. Smith, auditor, traffic receipts, of the Reading, has been appointed auditor, passenger traffic, succeeding **Philip J. Kelly,** retired, and **Alex. Miller, Jr.,** has in turn been appointed to succeed Mr. Smith as auditor, traffic receipts. Mr. Smith began

George W. Smith

his service with the Reading as a stenographer on August 1, 1889, and was advanced successively to secretary to the comptroller; statistician; general bookkeeper; chief clerk to comptroller, and, on September 16, 1925, to auditor, traffic receipts, holding the latter position

Alex. Miller, Jr.

up until the time of his recent appointment.

Mr. Miller entered the employ of the Reading on February 7, 1901, as clerk in the office of the auditor, traffic receipts, later serving as assistant bookkeeper and traveling auditor, and on November 1, 1925, he was appointed chief clerk to auditor, traffic receipts, the position he recently relinquished.

Mr. Kelly, who retires, became connected with the Reading as clerk and telegraph operator on January 1, 1883. He was promoted to traveling auditor seven years later and subsequently served in various positions in the accounting department, including auditor, traffic receipts, and auditor, freight traffic. He served as auditor, passenger traffic, from November 1, 1920, until his retirement.

Continued on Next Left Hand Page

Clean Flues

signify greater efficiency.

Railroads certainly do not blow flues for the fun of it . . . it must be then to insure greater efficiency in operation.

It's a tedious and disagreeable task and in the aggregate costs a lot of money.

BETTER FIRES

the kind that FIREBARS make not alone reduce this task and cost but better still give the locomotive greater efficiency at all times.

Firebar Corporation
CLEVELAND OHIO

OPERATING

Bruce H. Hamilton, first assistant to the superintendent of car service of the Pullman Company, has been promoted to assistant superintendent of car service, with headquarters as before at Chicago.

Effective April 1, the headquarters of **W. A. Hamler,** superintendent of the Pennsylvania division of the New York Central, will be transferred from Corning, N. Y., to Jersey Shore, Pa.

H. C. Munson, division engineer on the Chicago, Milwaukee, St. Paul & Pacific at Sioux City, Iowa, has been appointed trainmaster of the Kansas City division at Ottumwa, Iowa, succeeding **W. C. Givens,** who has been transferred to the First district of the La Crosse-River division at Portage, Wis.

M. H. Brown, superintendent of telegraph of the Oregon Short Line, with headquarters at Salt Lake City, Utah, has also been appointed superintendent of telegraph of the Los Angeles & Salt Lake. **C. J. Steinel,** superintendent of telegraph of the Los Angeles & Salt Lake at Los Angeles, Cal., has been appointed assistant superintendent of telegraph of that railroad, with headquarters at Salt Lake City.

The jurisdiction of **E. E. Regan,** general superintendent of the New York, New Haven & Hartford at New Haven, Conn., has been extended to cover the entire New Haven system, and to include the New York, Westchester & Boston, the New York Connecting, and the Union Freight Railroads. **R. D. Fitzmaurice,** general superintendent of the New Haven and the Union Freight at Boston, Mass., and **W. H. Foster,** general superintendent of the New Haven at New York, have been appointed general assistants, operating department, with the same headquarters.

C. K. Scott has been appointed assistant to general manager of the Erie, succeeding **J. E. Ingling,** promoted. Mr. Scott's headquarters will be at Jersey City, N. J. **J. W. Graves,** assistant superintendent, with headquarters at Jersey City, N. J., has been appointed superintendent of the Wyoming division and the Wilkes-Barre & Eastern, succeeding **H. R. Cole,** promoted. **F. X. Garland,** inspector of transportation, has been appointed trainmaster of the New York division, succeeding **H. A. Bookstaver,** who has been appointed chief trainmaster. **A. Rogers** has been appointed inspector of transportation, succeeding Mr. Garland, and **R. S. James,** yardmaster at Croxton, N. J., has been appointed general yardmaster, succeeding Mr. Rogers.

TRAFFIC

S. C. Matthews, assistant freight traffic manager of the Pennsylvania with headquarters at Pittsburgh, Pa., has been transferred to Chicago, in charge of the commerce bureau of the Western region.

A. A. Gallagher has been appointed assistant general southern freight agent of the Delaware & Hudson, with headquarters at Philadelphia, Pa., and **Monte Pickens, Jr.,** has been appointed to a similar position, with headquarters at Atlanta, Ga.

Harold K. Faye, freight traffic manager of the Western Pacific, with headquarters at San Francisco, Cal., has resigned, effective April 15, to become general traffic manager of the Phelps Dodge Corporation and subsidiary companies, with headquarters at New York.

H. H. Washer has been appointed general coal agent of the Chicago & Eastern Illinois, with headquarters at Chicago. **Luther Fuller,** general agricultural agent, has been appointed general agricultural and industrial agent, with headquarters as before at Danville, Ill. **H. V. Bowman,** general industrial agent, has been appointed assistant general agricultural and industrial agent, with headquarters as before at Danville.

F. G. Lantz, assistant freight traffic manager of the lines of the Erie west of Buffalo, N. Y., and Salamanca, has been promoted to freight traffic manager of those lines, with headquarters as before at Chicago, succeeding **Henry W. Forward,** who on April 1 was appointed consulting traffic officer of the western lines at Chicago. **L. H. Geller,** assistant general freight agent, with headquarters at Cleveland, Ohio, has been promoted to general freight agent at Chicago to succeed Mr. Lantz.

Howard P. Clements, passenger traffic manager of the Pullman Company, with headquarters at Chicago, has retired under the pension rules of that company, after 56 years of active service. Mr. Clements was born at Chicago on April 27, 1861, and entered the service of the Pullman Company at the age of 14 years as a messenger in the operating department. After serving in various minor capacities he was advanced to assistant district superintendent at Dearborn station, Chicago, in 1886, then being promoted to district superintendent in 1889. A year later he was advanced to assistant division superintendent and, in 1901, he became assistant to the general superintendent. In 1903, Mr. Clements was appointed assistant general ticket agent and in 1908, he was promoted to general ticket agent. His title was changed to that of general passenger agent 10 years later and in 1925 he was promoted to passenger traffic manager.

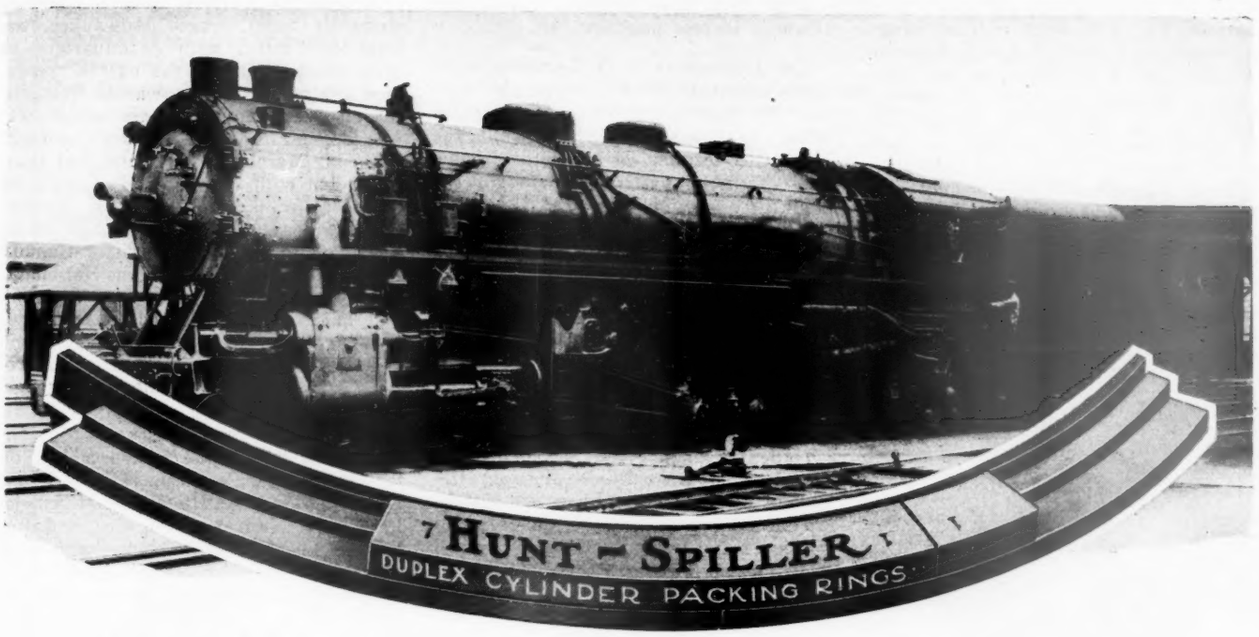
Howard P. Clements

George C. Smith, who has been appointed general traffic manager of the Missouri-Kansas-Texas, with headquarters at St. Louis, Mo., has been engaged in industrial development and traffic research work for the past 20 years. He was born at Newton, Kan., in 1887, and at the age of 14 years obtained his first railroad experience as a platform clerk for the Wells Fargo Express Co., at Norman, Okla. Mr. Smith graduated from the University of Oklahoma at the age of 21 years, and then continued his academic studies at the University of Wisconsin and Cornell University. Later he became a member of the faculty at Cornell University, teaching business organization and management, corporation finance, advertising and selling. In 1913 he entered the service of the Baltimore & Ohio traffic department, specializing in research work designed to stimulate traffic in connection with the reorganization of that road's industrial department. In 1919 he formed an industrial bureau for the Baltimore (Md.) board of trade, where he remained until 1923 when he became executive assistant to the president of the Canton Railroad in that city. Mr. Smith was appointed director of the industrial bureau of the Industrial Club of St. Louis in 1927, his appointment as general traffic manager of the Katy, in charge of freight and passenger traffic and industrial development, becoming effective on April 1.

George C. Smith

Charles H. Gattis, who has been appointed general passenger agent of the

Continued on Next Left Hand Page



Maximum power at low cost

MANY leading railroads have discovered that the cylinders of modern power can be kept steam tight for a lower cost by the use of HUNT-SPILLER *Duplex Sectional Packing.*

Locomotive engineers rarely complain about cylinder blows. Roundhouse reports show a big increase in mileage between cylinder packing renewals and there is a noticeable increase in the amount of fuel remaining in the tender after each trip.

The *Duplex* design insures maximum service life—both sections are of equal depth and the supporting spring is scientifically formed and heat treated to withstand high superheat temperatures.

HSGI
Reg. U. S. Trade Mark
Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings
Parts Finished for Application
Dunbar Sectional Type Packing
Duplex Sectional Type Packing
(Duplex Springs for Above Sectional Packing)
Cylinder Snap Rings
Valve Rings All Shapes

HUNT-SPILLER MFG. CORPORATION
J.G. Platt, Pres. & Gen. Mgr. V.W. Ellet, Vice-President.
Office & Works
383 Dorchester Ave. South Boston, 27, Mass.
Canadian Representative: Joseph Robb & Co., Ltd., 997 Aqueduct St., Montreal, P. Q.
Export Agent for Latin America:
International Rwy. Supply Co., 30 Church Street, New York, N. Y.

HUNT-SPILLER GUN IRON

Air Furnace

Seaboard Air Line, with headquarters at Norfolk, Va., began his railroad career as clerk in the office of agent, Associated Railways of Virginia and the Carolinas, at Raleigh, N. C., on February 1, 1894. In May, 1895, he entered the service of the Seaboard Air Line as clerk to the soliciting freight and passenger agent at Raleigh, and was promoted to city passenger and ticket agent on January 1, 1898. From June 1, 1905, to February 1, 1910, he served as district passenger agent, resigning on the latter

C. H. Gattis

date to undertake the position of general passenger agent with the Georgia & Florida at Augusta, Ga. In February, 1914, he re-entered the service of the Seaboard Air Line as tourist agent at Raleigh, N. C., remaining in that position until the United States entered the World War in April, 1917, at which time he was appointed general agent, Troop Movement Section, American Railway Association. When the railroads returned to private operation on March 1, 1920, he was appointed assistant general passenger agent with the Seaboard Air Line at Norfolk, Va., which position he held until his recent promotion.

MECHANICAL

H. E. Logan, road foreman of locomotives on the Chicago, Burlington & Quincy at Galesburg, Ill., has been promoted to master mechanic of the Centerville division at Centerville, Iowa.

J. S. Ford, master mechanic of the Centerville division of the Chicago, Burlington & Quincy at Centerville, Iowa, has been transferred to the La Crosse division at North La Crosse, Wis., succeeding **C. W. Robertson,** who at his own request has been assigned to other duties.

J. E. Ingling, assistant to general manager of the Erie, has been appointed supervisor of fuel and locomotive operation, with headquarters at New York, succeeding **T. F. Howley,** retired. **G. H. Higley** has been appointed general air brake inspector, with headquarters at Meadville, Pa., succeeding **T. W. Dow,** retired and **J. R. Connorton** has been appointed supervisor of air brakes, Mr. Higley's former position.

The jurisdiction of **G. Lamberg,** shop superintendent of the Chicago, Milwaukee, St. Paul & Pacific at Minneapolis, Minn., has been extended to include the Twin City terminal and Duluth division. **John Turney,** master mechanic of the Twin City terminal and the River, Iowa, Minnesota and Duluth divisions at Minneapolis, has been transferred to the Sioux City and Dakota Division at Sioux City, Iowa, succeeding **W. C. Kenney,** who has been assigned to other duties. Jurisdictions of **F. P. Miller,** master mechanic at Portage, Wis., **A. M. Martinson,** master mechanic at Mason City, Iowa, and **William Joost,** master mechanic at Milwaukee, Wis., have been extended to include the Second district of the La Crosse-River division, the Second district of the Iowa and Southern Minnesota division and the Madison division respectively.

ENGINEERING AND SIGNALING

B. O. Johnson, resident engineer on construction of the Polo (Mo.)-Birmingham line of the Chicago, Milwaukee, St. Paul & Pacific, has been appointed division engineer at Sioux City, Iowa, succeeding **H. C. Munson,** who has been transferred to the operating department.

W. G. McDonald, supervisor of buildings of the Chicago, Burlington & Quincy, Lines West of the Missouri river, has been appointed supervisor of bridges and buildings of those lines, with headquarters as before at Lincoln, Neb. **W. F. Bucknell,** supervisor of bridges of the Lines West of Missouri river at Lincoln, has been appointed master carpenter at Hannibal, Mo.

PURCHASES AND STORES

E. A. Ernst, district storekeeper on the Chicago, Rock Island & Pacific at Shawnee, Okla., has been transferred to Horton, Kans., succeeding **C. H. Schneider,** deceased. The position of district storekeeper at Shawnee has been abolished and **C. P. Clark** appointed division storekeeper at that point.

OBITUARY

Lewis D. Newman, secretary and manager of the Great Northern Iron Ore Properties, with headquarters at St. Paul, Minn., since 1917, died at Los Angeles, Cal., on March 28, at the age of 42 years.

J. H. Markley, master of bridges and buildings of the Toledo, Peoria & Western, with headquarters at Peoria, Ill., died in that city on March 28. Mr. Markley served as president of the American Bridge and Building Association in 1906-1907.

William D. Carrick, general baggage agent of the Chicago, Milwaukee, St. Paul & Pacific, with headquarters at Milwaukee, Wis., for the past 47 years, died at his home at Wauwatosa, Wis., on March 27, after an illness of several months. Mr. Carrick was born at Galt, Ont., on March 12, 1859, and had been connected with the baggage department of the Milwaukee for 52 years. He entered railway service at the age of 13 years on the Great Western of Canada (now part of the Canadian National). In 1882, he was appointed assistant general baggage agent of the Milwaukee, being promoted to general baggage agent in 1884. He was president of the American Association of General Baggage Agents in 1919-1920.

Clement W. Nelson, vice-president of the Arkansas & Louisiana Missouri, the Louisiana & Pine Bluff, the Mansfield Railway & Transportation Co., and the Nacogdoches & Southeastern, who died at St. Louis, Mo., on March 21, had been in railway service for more than 30 years. He was born at Morristown, Ill., on July 12, 1870, and obtained his first railway experience with the Adams Express Company. Later he was connected with the Great Northern, and in 1899 entered the service of the St. Louis Southwestern. In 1906, Mr. Nelson was promoted to assistant general manager of the St. L. Sw., and assistant to the president of the St. L. Sw. of Texas, with headquarters at St. Louis. He relinquished the title of assistant general manager in 1913, and was appointed assistant to the president of the Cotton Belt System. In 1914, he was elected vice-president of that railroad, then being appointed western representative of the American Railway Association two years later. During the World War, Mr. Nelson served in various capacities for the government, including those of assistant ordnance district chief and vice-chairman of the war claims board. In June, 1920, he was elected president of the Frost Company and vice-president of four short line railroads in which that company is interested in connection with its lumbering operations.

THE RAILWAY AND LOCOMOTIVE HISTORICAL SOCIETY (Boston) has issued its bulletin No. 24, dated March, 1931. This is a pamphlet of 44 pages devoted almost entirely to a narrative of the Chicago, Burlington & Quincy from the birth of the company (1855) down to the year 1886. Like similar bulletins in former issues, this work takes the shape of chronological notes, year by year, the space occupied for each year depending upon the fulness or lack of fulness of the annual report of the company for that year. The mechanical department is uppermost in the mind of the editor, and very full information is given concerning the locomotives. Ten of the older designs of engines are illustrated in half-tone engravings made from ancient photographs.